FERRANTI

public outery against it.

It is understood that a final

decision will be made after Pre-

it in the Press," commented a spokesman at the European

office in London, which is res-

position of interested by-

almost a year for the Depart-

ment of Commerce to grant an

export licence for the machine.

The contract, for a small 1100,

was placed last September, and

as well as the central computer

includes concentrators and

.communications subsystems.

Computer Marketing

MS instruments high spead cassette deta

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Working with and supported by British manufacturers

Univac has aiready waited

'We have heard nothing

NEWS IN BRIEF US may ease

AT&T path
THE US government's Federal
Communications Commission is proposing moves which would make it easier for AT&T to compete with Satellite Business Systems and others in the data communications market.

The moves involve a change in the 1956 consent agreement between the Justice Department and AT&T which precludes the latter from entering any data processing business. The Justice Department is, however, opposed to any change in the consent agreement without structural alterations in AT&T, principally the sale of the Western Electric manufacturing

ICL's graduates

sident Carter returns from the facilities for sports journalists at economic summit meeting in the Olympic Games, but US Bonn, Nevertheless, Robert Byrd, majority leader in the US lieve that the system has con-THE first 30 non-white students Senate has been quoted as siderable potential for use in to graduate from ICL South saying that the sale has been Africa's training school for problocked — at least temporarily. grummers and operators received their certificates from Despite the speculation sur-ICL managing director Dr Chris Wilson in Johannesburg this rounding the fate of the order, Univac itself has heard nothing.
"We are having to read about

Link-up delay

OVERTIME ban by the Post ponsible for Eastern bloc sales. Office engineers is contributing to a delay in linking the New official cither way from the Decastle University Multiple partment of Commerce. If the the fight for more humane Access Computer system with an IBM 370/168 and 360/67, to sale has been blocked, it would be a departure from normal procedure for the decision to be the network that links London University computers. released generally before we were informed. We are in the

Standard parts.

FOR the sake of standardisation. British Leyland has decided to stop using NCR's PCMI Ultrafiche for its car parts catalogues in favour of standard 48X nicrofiche produced on COM. This will allow one reader to be used for different companies!

Question on race may be cut from census Till: next census, in 1981, will contain a position on implementing the BCS' suggest to a positive programme for improving question asking people their race, according tion that there should be independent housing, etc. It would be preferable if it was

US may block

sale to Soviets

A SMALL Univae 1100 mainframe wanted by the Soviet News Agency, Tass, last week became a pawn in the power play between the US and Soviet governments. Tass

has claimed that it needs the computer in part to provide message services for visiting journalists covering the Moscow Olympics in 1980; but the US government is.

Sources close to the White House say that active consideration is being given to

"internal security".

The message switching sys-

tem is needed in part to provide

critics of the proposed sale be-

Leading the chorus of critic-

ism has been New York senator

Daniel Patrick Moynihan, who

said of the computer, "It would

help the Kremlin keep track of

Zbigniew Brzezinski, pre-

sident Carter's national security adviser, is understood to favour

the use of trade as a weapon in

the subject is believed to have

laken place last week between

Commerce does grant a licence

given by GoCom, the West's co-ordinating committee on trade

every dissident in the Soviet

considering blocking the sale in protest against the jalling of Soviet dissidents who tried to monitor implementation of the Fleisinki agreement on human rights.

refusing an export licence for the Univac machine but that no decision has yet been

the Data Protection Committee, which is tion, she said. The recently published White Paper on already very late. No names and addresses the census affirms the importance of will be entered on the computer.

data, but it says the government reserves its race would only be acceptable if it was tied what race he is.

to current government proposals. Health
Minister Roland Moyle said, however, that
the question might be dropped if there was a
the question might be dropped if there was a

The question would have to be carefully phrased to avoid confusing ruce with relimaintaining security of the central com- Patricia Hewitt, of the National Council gion, she added. Also, it must be the responputer system that will process the census for Civil Liberties, said that a question on dent and not the census-taker who decides



reading progress

NOTABLE success in teaching adults to read has been shown an experiment using a nei package for "basic skille" Control Data's Plato system Several hundred "functionals illiterate" people in the US we given reading training on the online terminals, and gained on average one school year is reading level in 12 hours in struction. Similar success w also shown in maths teachin where 113 years' progress wa made in 20 hours.

Functional illiterates, of whom there are estimated to be 23 million in the US now, are those whose inability to real comes from lack of teaching rather than mental handicap.

The Basic Skills Learn System, soon to be released by Control Data, is aimed to pro vide computer-aided learning people with this kind of die culty in a variety of subject This type of teaching is popular with students, Control Day says, provides motivation, at

reduces drop-out rates. Plato is a special-pur bureau service provided by Control Data using a networked mainframes in Minneapol Chicago, Quebec, and Brussek and special terminals with graphics capability. Custome could be the training depart making microprocessor boards; or universities or schools, and they can either use Control

Data's course packages or will

NCR rejects voluntary the fight for more humane treatment of those-within the USSR who are opposed to the redundancies to be made at NCR's Dundec plant between October this year and March 1979 due to the fall in the

gested at one time.

number of people needed for

(CW, July 6), is now expected to

be 85 although 200 was sug-

Shadow industry Secretary Sir Keith Joseph officially opened the

Shadow industry Secretary Sir Keith Joseph officially opened the factory at Crawley, Sussex, where Redifon Computers aims to produce 50 of its R-range distributed processing systems each month (CW, April 13). Sir Keith is seen here discussing configuration test equipment with Redifon Computers' managing director Roffen Kevas

government, and a meeting on AFTER months of discussions NCR has rejected the proposal Brzezinski and White House ballot of its staff to see if they that there should be a voluntary Press secretary Jody Powell.

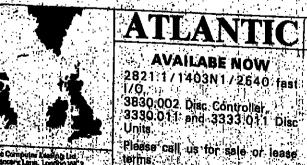
Even if the Department of (CW, October 27, 1977). The for export of the machine, that it should be the negotiating approval will still have to be body for all the appropriate grades in the company and the with the Eastern Bloc. Any bitration Service will carry out a further delays could cause problems in getting the system up represents 800 NCR field engin-

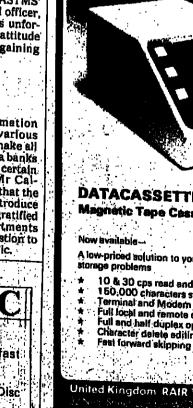
and tested out before the Olympics. At present even the model of computer has not been Commenting on the company's refusal to agree to a volun-tary ballot Jim Mercer, ASTMS Univac has only sold one North London divisional officer, other large system to the Soviet Union, an 1106II which will said NCR's decision was unfortunate and reflected its attitude handle international reserva-

Secrets Act reforms

THE government has decided A Freedom of Information not to introduce a Freedom of Information Bill at present, but backbench MPs, would make all will propose some reform of the government files and data banks.
Official Secrets Act, the Prime open to the public, with certain specified exceptions. Mr Calthe government's reasons for this and the changes envisaged to the controversial Section Two of the Official Secrets Act is expected this week.

laghan said he regretted that the government could not introduce such a Bill, but he was gratified that government departments were acting on his suggestion to make more material public.







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Thursday, July 27, 1978

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BUSINESS

PLANNING

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Privacy

report for

Rees

THE long-awaited report of the Date Protection Committee is

expected to be delivered to the Home Secretary, Mariyn Roos,

by the beginning of next week.
If he then decides to publish it,
and indications are that he will,
it will take at least three months

before it is available to the pub

the report will be unanimous without the minority report the

had been predicted, the com-mittee having made a special effort to patch up its dif-

ferences. These have been

It now seems probable that

Unigate order goes to Univac

THE battle to win the big Uni-gate order (CW, May 11) has been won by Univac against competition from ICL, which was trying to keep a prestige customer, and IBM. Under the £2.5 million deal Univac is to supply an 1100/12 to Unigate Foods at Trowbridge, Wilts, where it will replace two ICL 1904As. The system will include 34 UTS terminal systems which, among other applications, will be used for online program de-

A second phase of the project ncludes a 90/30 to replace a 1902A and a V77-600, the Univac mini based on Varian designs, to replace a 1901A.

400 redundant

ABOUT 400 people at the Texas Instruments factory at Bedford are to be made redundant due to the transfer of some discrete component manufacturing to Ti's Plymouth factory. Despite the 20% reduction in its workforce Bedford will still be TI's biggest plant in Europe.

Tory policy

SET up by Sir Keith Joseph earlier this year (CW, April 20) the Tory party's working group on information technology hopes to have its position paper ready by mid-September. Chairman of the group lan Lloyd, MP for Havant, told Computer Weekly that the group would spend another two or three weeks taking evidence from specialists, in-cluding GEC managing director Sir Arnold Weinstock, before writing the report.

BCS moves in

THE British Computer Society is expected to move into its new eadquarters next week, at 13 Mansfield Street, London W1M OBP, just around the corner from its existing Portland Place centre. Its telephone number remains the same: 01-637 0471.

Shorter week

THE Post Office Engineering Union says that the Post Office's live per cent planned reduction in inflation-linked telecommunications costs and speeding up of introduction of System X can only be achieved with its not be forthcoming unless the principle of a shorter working week is conceded. Post Office White Paper — page 48.

Amdahi record

SECOND quarter figures for Amdehl Corp Were again a record, with pre-tax profit up 83% at \$22.3 million on turnover up 64% at \$73.9 million. The COMPUTER WEEKLY'S INSIDE NEWS THE MICRO CRAFT quarterly dividend has been doubled to 10 cente a share on the stock, which was split two-for one in April. The announcement of the MEB's Innion venture dominates our first three is another like to the direction of how Britain keeps a foot in the micro industry race what effect will the micro have on our home and work lifestyles? In the latest of our peries examining the impact of micros, Fred Lamond suggests that the new sectionary could have that the new section on or eventually the devin of a return of a new oraff age restring creative joy to many manufacturing processes. for-one in April.

Computacar sold

THE Thomson Organisation, which publishes The Times, has bought the Computacar computerised match making service or buyers and sellers of new and used pars, from Unitery Computer Services.

Mixed reception for Inmos panies, was contradictory. "We

been revealed about the Natioductor venture have not answered all the critics, although there were some positive res-

THE INMOS PROJECT —PAGE 3 GEC'S PLANS — PAGE 15

lan Lloyd, MP for Havant and chairman of a Tory working party on information technoogy, commented that the three individuals setting up the new company called inmos, were very competent, well-informed people with a considerable record in the microelectronics

TASS, the Technical, Admin-

SRC grant

THE Science Research Council's distributed computing project is likely to aim at standardising networks on the Digital Equipment LSI-11 processor to encourage co-operative work

team?

mong the centres involved.
One of the grants is likely to One of the grants is likely to go to Professor. Peter Kirstein's team in the computer sciences department at University Col-lege, London, for work on net-works, particularly those based on the X25 protocol. The grant is likely to be spread over three years and will fund a study of the design and evaluation of high level protocols, including data rates and reliability.

Full details of the SRC grants will be given in mid-August. The total available money for the projecte is £2 million over three years.

to US data banks

US is wasting large sums of

public money on transatlantic

telephone calls, claims Dr.P. S.

Davison, director of the Scien-

tific Documentation Centre in

Dunfermline. His MP, Adam

Hunter (Labour) has asked the

Civil Service Department for

figures on exactly how much

manual scientific information

retrieval service, has been a

vociferous critic of com-

puterised bibliographic retrie-

'Wasting large sums on calls

RETRIEVAL of scientific infor- val. Recently he claimed that

mation from data banks in the automation in this field was

Dr Davison, who runs a the department's total telecom-



Richard Petritz (left), who has been named managing director of the company. Deputy managing director is Dr Paul Schroeder (centre), and UK

From Hesh Wiener and Cameron Davis in America

istrative and Supervisory Sec- that the government's plan to tion of AUEW, welcomed the set up a new company and at the venture, but lan Benson, speaking for the union, thought

THE proposed implementation

of X25 as the protocol for the

US telecommunications giant

AT&T, and a push by the US

enforce a much-criticised

input/output standard as the

first mandatory US government Federal Information Processing

Standard, have given further impetus to growing efforts to

The X25-based AT&T net-

work is the long-awaited Ad-

vanced Communications Ser-

vice (CW, July 13) which will

aggravating the current serious

Hunter asked 13 Parliamen-

tary questions on expenditure from public funds on telephoned

enquiries to computers in the US and other countries, Charles Morris, Civil Service

Minister, replied that these costs

MASTER AND SERVANT

"Like fire and water, an operating system can be a good servant but a bad master" is how Bernard Allen Introduces his main theme in this

week's typically lively round-up of the Ops World, Page 13

The seems for the grand final of the Letters to the Edits Computesters instantialed DP gressel for job-bur sports computation have now been Report from India decided. And the finalists make an IBM shreat to DEC impressive list. Page 17

APPOINTMENTS: PAGES 20-46

e not dis

FINALISTS:

unemployment of graduates.

National Bureau of Standards to

data network service from the

same time invest £70 million in existing microelectronics com-

throughout the US. It is ex-

pected the node processors will

be Digital Equipment PDP-11/

70s using AT&T's UNIX

By proposing X25 in its peti-tion to the Federal Communica-tions Commission, AT&T could

be posing a threat to IBM's SDLC-based network protocol.

ACS will also provide US users,

particularly smaller organisa-tions, with an alternative to

IBM's communication services

which are now deeply commit-

ted to the Satellite Business

Industry observers in the US suggest that user organisations may pause to reflect on the AT&T offering before expan-

ding their communications ser-

showdown in orders of

communications-related equip-

ment. If the FCC approves the

ACS proposals, the network is scheduled to go live by the end

that all US Federal installations.

should implement the IBM-

designed I/O standards comes

after a cooling-off period of a

few months following a heated

debate, with opposition to the

The move by the NBS to insist

vices, causing a potential

operating system.

Systems venture.

of next year.

munications expenditure. standards being mounted pri-Hunter has said he is not marily by mainframe manufac-

satisfied with this answer and is turers; who say that the pressing the Minister further, standards might soon become,

ALSO ...

Computerview on the NEB Operacques ASTMS US han opens Soviet door MoD staff strike threat

Gilli on a soft system Software File Ruziler People in the news

Report from India.

marketing thrust. There was a fear that Inmos products might be subsidised,

reducing, it was suggested, "the technological edge that only free

But far from capitulating to

the argument, the standards

bureau has strengthened its

proposal and tightened its

permission from the Secretary of

their use would cause "a major

adverse economic or operational

● Turn to Page 14

Commerce on the grounds that

implementation requirements.

are concerned that the govern-

ment does not appear to have a

coherent policy on either the

ndustry or on the social impact

The view from the City and

The fact that the company will

largely be run from the US was

regarded as a major plus, since it

would make it easier to acquire

the necessary management

techniques and international

from industry, where few people wished to be quoted, was decid-

edly less favourable.

Boost for X25,

deep.
There is considerable impatience in the computer industry to see the report, because projects are being held up until there is some idea of what legislation will be brought in affecting them. Conscious of this, the committee has taken I/O standards steps to attempt to hypers the publication delay in Her Mejes-ty's Stationery Office, which is usually six months at present.

IBM contract consist of local nodes scattered or already are, obsolete.

for AMi

FOLLOWING the \$25 million order to Intel for 4K memory suggesting that the only way a Federal agency could waive the standard would be to obtain chips (CW, July 13), IBM has given American Microsystems Inc a contract for design of a static RAM in AMI's proprietary VMOS technology. VMOS chips are as fast as any on the market, and 40% more compact, with impact."
The NBS has proposed a package of standards including consequent cost savings, an AMI spokesman in Santa Clara, California, told Computer

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Computer Weekly to seed free of classing to the following satisparies in the lot and the entry temporary directory, company secretaries, passagement services exceptives, built servants responsible for computing, management/computers operations; lee-tures and leathers. Of managers/unpersieers, systems and leathers for a managers/unpersieers, systems and letter for a managers officers, programmers, operation, computer sales men. Red engageses.

Computer Weekly has a circulation such week of over \$2,000 including the highest lefty requested circulation in the U.S. The International adition, which is published in these a year, has a circulation of ever \$4,000.

When the bitching about the NEB should stop

want to see the National Enterprise Board's Inmos micro venture fail, particularly those with a political axe to grind against public investment and the established firms who would not like to see a successful newcomer enter the market.

In the period between the political leak of the NEB's micro plans (CW, June 1) and the official announcement of Inmos (see page 3), the anti-NEB forces were quick on the draw, suggesting that the whole scheme was barking up the wrong 64K tree, that it was a waste of time trying o challenge the Japanese and Americans, that £50 million is insufficient investment, that it would be another waste of government money. . . and all that was before the NEB had

announced anything officially. The actual plans for inmos, however, reveal a breath of level-headed entreprenourial fresh air which should be welcomed by all those who are usually so quick to bitch about Britain because of the country's supposed mis-spent public wealth (British Leyland, Concord, et al) and private sloth ("lack of incentives", etc).

Inmos is clearly a risk, but a

AS an activity, charging out is not limited to the completion of the operators night shift. It also relates to running a computer installation on a realistic cost

Not so very long ago, charging out was all the rage, and was in no way confined to the company

accountant on the receiving end

of an unpalatable computing invoice. The DPM was none too

happy having to comply with requests for realistic costings.

Countless and often fruitless

hours were spent analysing in

minute detail the true cost of

producing one extra weekly

sales forecast, It was during these exercises that the DPM

wished he was online to his own

computer rather than to his dosk

calculator. Should overtime rates be cal-

culated with or without holiday qualifications?, Should special

engineering standby be in-cluded? Should the cost of

switching resources from deve-

loping a real time system to

improving current projects be justified? The results of such

studies were usually upsetting

The user department faced with a considerable figure,

The company would order an

Oceanic Rentals

Short term rental and leasing of industry standard terminals

Printers - KSR, ASR, 30cps, 120cps

Portable printers - built in acoustic coupler

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Acquistic couplets

Paper tape reader punches

Hewlett-Packand desktop computers

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FOCUS

of success; and success will American as well as British enmean a lucrative British foothold in one of the most and possibly the Far East as well

Although the potential rewards are high, the price of failure would be relatively low - £25 million as an initial investment, which is peanuts in terms of government expenditure on other industrial projects.

Although the NEB plan created some initial bitterness within the Department of Industry, whose view is that it is too late for Britain to get into the mass volume "standard" micro market, inmos is complementary to the DoI plans, which are dustrial life and the rest of the concentrating on the applica-tion of micros (CW, July 13).

By master plan or chance, the government (albeit belatedly) now has a number of initiatives covering a spectrum of activities in the micro field. Failure of any one would not leave the country entirely nakéd

But the most impressive and exciting aspect of Inmos is that it is, from the outset, an international operation built on international skills and aimed at

Government money to back trepreneurs (and jobs in the US important industries of the fupolitical Left as much as the notion of any public investment

in industry horrifies the Right. However, the multinational aspect of Inmos indicates that the venture is based more on a perception of real opportunities rather than being subservient to political theory.

The fact that Britain is providing the venture capital for this type of technological project will be a sign to the world that Britain is a force to be reckoned with in modern inworld is likely to be impressed with the NEB's ability to attract men of the calibre of Petritz, Schroeder and Barron; such men are not likely to commit them-

selves to such a project lightly.
It is to be hoped that within Britain, Inmos is given the objective backing that it deserves and that, most importantly, it does not become part of a political tug-of-war, with the dislike among some Tories of "government interference" blinding the party to the potential of this exciting industrial initiative.

The gentle art of charging out

, immediate re-appraisal of all DPM who believes it is in his

regretting ever getting involved and seminar, no matter how in charging out, realistically suspends the upgrade project until a more appropriate time,

Hardly surprisingly, charging out was left out of most DP feasibility studies, being replaced by a more phlegmatic approach to costing. If the company requires a new application then it must be of value, regardless of development and production costs.

Although many costs are fixed the configuration, staff, consumables and accommodation sumables and accommodation atc—it is the incidentals, in the fringe areas of computing, which tend to blow the carefully prepared continuous that of concealing is of figures arrive on the managing director's desk, he would be very quickly charging around in our prepared continuous training but that of concealing is a concealing but the concealing but the concealing is a concealing but the concealing prepared costing budget — the directions, and before long, the dataprep girl who alternates her accountants team would be The user department, faced phone calls between the comconstants team would be with a coinciderable figure, puter centre and her Kallan boy with orders to slash all in sight, application or perhaps recruit a running a profitable side in a while enhancement would be couple of additional clerks to repairing hi fi and motorcycle. On balance, leaving well alone equipment in installation time; should be the objective of DP eves it is his duty to introduce every known and unknown schnical development and heory into his system or the

The DP department, while own, as well as his company's interest, to attend every course interest, to attend every course

remote, in distance and content. DP savings are certainly feas-ible especially in large-scale in-stallations. Even after allowing for equipment, service and staffing costs, there could still be 40% of the DP installation budget available. This amount is absorbed by such items as consumables, telecoms and services and in each area there is consid-

erable scope for cost economies. The art of charging out is not so much that of revealing but quickly charging around in all directions, and before long, the

management. Any cash balance left over from the budget should be placed in the DP installation. preservation fund, and the cost charged out to contingencies.

Tèn years ago. COMPUTER WEEKLY

THE first bureau Univer 1108 in the UK went into operation for Scioon in London. These hybrid machines, one H\$7.3 and two H\$7.1s were ordered by UK aducational establishments from Sciagram. A\$1.8 million order for Honeywall equipment was signed by Litt-

JULY 25, 1968

lawdode mell order firm. The first Argus computer information ayatem to be installed out is de UK went to BOAC's offices in New York. A new sport chese with the aid of computer, was predicted by Saviet typernetine expert, sceedemical Victor Glushkov.

Music device wins Philips/CW competition

A SYNTHESISED music key- sisted of David Bully board ins rument which can be used for teaching or combe used for teaching or combe used for teaching or combe and Portners consultancy, to posing music, has been van Zanten, planning and judged the winning entry in applications engineer with Philips Professional and the Philips Professiona Philips / Computer Philips Professional Reco. Weekly digital cassette ding Department in Find recorder competition.

The judges unanimously Hipwell, an editorial director chose this application, devised by Dr Stephen Castell, Press. of Wickham Bishops, Essex, as the most original and interesting entry and have awarded him the prize of an all-expenses paid three-day Because of this the judge veekend in Holland for two. The judging panel con- be awarded.

I WAS reminded the other day of the Cambridge Titan and the Maths Lab, and some of its lovable (in retrospect) foibles. The Titan multi-access system did obvious things.

When you came to log in, you pressed the RETURN key on the terminal and it said: LOGGING IN, and waited for your ID. At this point, unfortunately, it would often respond with SYSTEM FULL (Titan was very popular), and a further LOG-GING IN had to be elicited by typing RETURN. The only way to ensure getting in was to keep on trying and hope that you'd be the one Titan looked at first when another user had log-

Impatience was, of course, ife and the RETURN key was often battered and bashed far more than necessary. Now, when you typed in to Titan simultaneously with Titan typing out to you, the printout would get muddled and LOG-GING IN became NOGGING ON, OGLING IN, MUGGING IN, LOBBING ON and so on. Users were requested to optimise their machine usage toallow others a chance, so it was quite just that Titan sent perhaps its best and simplest permutation to one computing devotee who, on his own admission didn't have to use the computer at that heavily booked time. "HOGGING IN" it said to him as he leaned on the RETURN key for the umpteenth

MORAL: Log in, don't hog in The £5 interrupt prize for this entry goes to John Davidson of Cambridge.

The response in the student section was disappointing and no original decided that no prize would

inmos gets

market competition could bring." If similar companies sprang up in other countries the end result might be a European products.

British industry might als suffer if it was directed to buy from Inmos rather than from the free market, and there was a feeling that joint ventures with two or three established US manufacturers would be a belter

intend to second source components from anyone else. 'although other companie might well second source from Graham Meek, electronics in

dustry analyst with stockbrokers Wood Mackenzie, a pressed surprise at this. "Second sourcing would help to built wide product base on which to fund research and development." he said.

The scope of the venture was regarded in the city as unrealitic, and talk of £250 million in four to six years was thought to be unattainable. It was pointe out that Intel, which operated in much more favourable conditions than Inmos faces, only managed to grow from \$4.2 mll-1975. Capital investment at one of the US majors will be \$200 million in 1978 alone.

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DUBING Wings Appea

Royal Air Forces Association, 43, Grave Park Road, Loads W4 3RU (Incorporated by Royal Charter and registered under the W Charisias Act 1940 and Charisias Act 1960).

GEC ops accuse ASTMS of 'lack of support' THE 16 sacked operators from GEC who offer of arbitration, the operators finally

accepted the company's offer of arbitration accepted on July 14. and went back to work at the Stoke, Coventry plant this week (CW, July 20) did so because of a lack of support from ASTMS

"We had to go back to work because the branch members were not giving us their backing," said John Hardie, a shift supervisor and the operators' union representative. each member on behalf of the operators was After continually refusing the company's reduced from £2 to 50p.

Process

control

venture

supported

To finance the continued deve-lopment of a distributed process control system, colled MPC 80, the NES is putting £1.17 million into Negretti and Zambra of Aylesbury, a firm which specialises in precision instru-ments and process control

quipment.
The deal will give the NEB

nearly 30% share in the com-

According to Hardie, events which oc-

curred earlier that week put the operators in a situation in which they had no choice other than to return to work.

operators' P45 cards had been sent to their respective homes, and on the following day they received the cards.

The dispute started because the operators are unhappy with the company's offer of increases of £2, £3, and £4 per week for operators, senior operators and shift supervisors respectively.

It is understood that the arbiter is to be

operation and will have genera

puter plans of Inmos.

responsibility for the microcom-

More key executives are ex-

The board of the NEB has

approved the business plan,

which calls for a peak funding of £50 million. The first £25 million

has already been committed to

the venture, and the provision of

the remainder will depend on the

company's achievements.

pected to be appointed shortly.

Barron will be responsible for establishing the UK end of the

George-Brown on the button

Stapeley House at Nantwich, Cheshire is the new headquarters and computer centre of NMW Computers Ltd, a stockbroking computer bureau. A marquee in the grounds of the house was the colourful setting for the official opening of the centre and seen here prassing the button that connected NMW's stockbroker clients to the dual ICL 2969 system installed there is Lord George-Brown, who was invited by NMW to perform the opening ceremony.

With Lord George-Brown are the managing director of NMW, Brian Johnson (left), and the company's chairman, Brian Bibby, NMW provides accounting and settlement services for its clients who are equipped with Ferranti terminals linked to the 2980s at Stapeley House. The ICL machines were ordered last year (CW, April 28, 1977).

NEB transatlantic micro venture

a TI research facility in the UK.

ding fathers" are one of the best

known figures in the British

computer industry, Computer

Technology founder lann Bar-

ron, and, representing a major

coup for the new company, Dr.

Paul Schroeder, who joins

Inmos from Mostek, where he

was director of memory design

engineering and is best known

With him as the Inmos "foun-

AN American managing director and production facilities in ten years, during which time he was responsible for establishing the US and possibly the Far East, as well as Britain, are key features of the plans that have been announced for lnmos, the National Enterprise Board's venture into the memory and microcomputer market.

It is likely that the US development facility will be esta-blished first and that the Far East will be used initially for

The corporate headquarters

Inmos will aim directly at the

developing for VLSI microcom-puters and storage devices

MOS process technology

chip microcomputers.

nanufactured using N-channel

Inmos managing director will

be American semiconductor

pioneer Dr Richard Petritz. who

helped found Mostek and who

The MPC 80, which is based package assemblies. on the Intel 8080, can contro The US base will be a small as the designer of the industry on the intel ausu, can control
sequencing and data logging in
continuous process manufacturing and existing users include
ICI, BP, Heinz and the British prototype development factory, standards 4K and 16K RAM dewhich could eventually employ about 1,000 staff. It is expected Sugar Corp. The latest version of the that about 4,000 jobs in the UK will be created by the mid 1980s. MCP80 is a radical distributed system with up to 15 proces-According to stockbrokers Wood Mackenzle, this indicates ors. This can be progra a turnover target of about \$100

n high level language called Senztrol designed for use by million a year. process engineers. Negretti and Zambra also will be in the UK. atigue control system for the volume world markets that are

Japan orders more scanners

EIGHT more EMI brain scan-

Tornado multi-role military air-

ners have been ordered for Japanese hospitals by Toshiba, the Tokyo Shibaura Electric Co, which handles marketing and distribution of the systems in Japan. The CT1010s, valued at over £2 million, are scheduled for delivery by the end of this

The much discussed 64K RAM will not be the only product from the company. Other storage devices such as ROMs and EPROMS are almost certainly on the stocks, along with single

was director of semiconductor R&D for Texas Instruments for Blow to NCR in the COM market

THE computer output microfilm its existing COM users, and will end of September. Instead they system to market in Europe. will be marketed by Agfa Gevaert which signed a distribution agreement with Quan-

espite what it describes as its unqualified success" in mar- This is because they provide

systems manufactured in the US
by Quantor will no longer be
continue to use Quantor equipment in its own COM bureaux. It old in Europe by NCR after the is now looking for another COM

Agfa-Gevaert already sells the Calcomp 2200 alphanumeric COM recorder in Europe, but NCR says that it will cease marketing Quantor recorders will complement the 2200 very

keting the Quantor equipment, NCR adds that it will continue to provide a full technical service, including software support, by the 2200 needs to be pro-modifications and supplies to all cessed separately.

Danish travel firm to set up distributed booking system

DANISH travel company Tjacteborg, which was the first such company to operate online reservations for holiday fours, is now seeking to be the first to set up a december of the first to set up a decentralised online booking system.

It has ordered computer ment worth £1.75 million

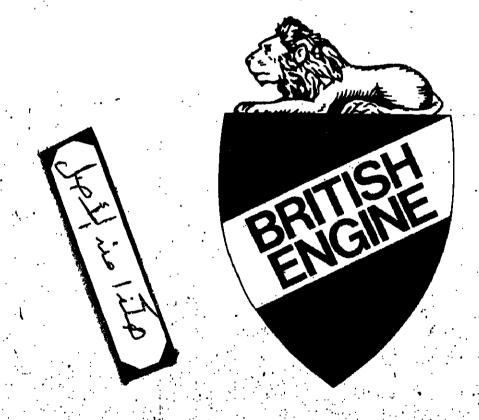


sing to match the increase in the number of tours booked. These have risen from 150,000 to over 800,000 a year and are expected to reach 1.5 million a year by

In the new system, which replaces a big central CDC sys-tem, work, will be handled locally in each European centre with satellite computers which, although operating independently, will be able to exchange information with one another

when necessary. The first part of the network, an NGR Criterion V-8570 system, is being installed at Tjaereborg's headquarters near Esbjerg, Denmark.

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WE need better communication tools with other professionals, with our clients and users, and even with ourselves: so that we can organise our own creative thinking in a more rigorous manner. There is such a tool in the

engineering field of cost-value analysis. It was brought into the computer field by TRW. systems engineers about 1974, ind was called the Requirements/Properties Matrix. Using this as a practical inspiration, I have made use of the method in a number of consulting situations as a tool for documenting and analysing a system design. Everybody who has come into contact with it seems to consider it to be a powerful and useful tool for specifying and qualityinspecting a system design, so I would like to share some of the details about it here.

The tool is called the Function/Attribute/ Component Table. The "Attributes" are listed vertically on the left of a decisiontable like form. The attributes correspond to well defined system goal areas such as cost, felivery date, ease of human use and learning, portability, reliability, etc. When necessary, for added detail and measurement precision, these goals can be "exploded" in a root-like manner, and sub-

tables may be created at will.
The "Functions" are simply any interesting set of functional viewpoints of the system. They may overlap, they may be motiviated by the interests of any party. They may be hardware, software, documentation or organisational components of the proposed sys-tem. You may need to present several different viewpoints on separate F/A/C/T sheets, to satisfy various needs. A func-

attributes, be "exploded" for attribute of positive natur more detail. For example PRO- (like reliability) and usually GRAMS could be detailed into specific programs. The system or more resource attributes planning can take place top (cost, delivery date, project down by means of such explo-sions, until such a level of detail is reached that conventional low level specification three-dimensional architectutechniques are appropriate ral drawings, at the higher (structured design, pseudocode etc). Functions are listed horizontally across the top of

The COMPONENTS are de- equivalents of these in your sign components. These are only referred to by a symbolic AF/A/C/Table allows much code in the intersections be-Attributes. A code such as at the early stages, when it is DBAUDIT might be used to refer to a design decision such

ALL MAGNETIC FILES ABLE AS FAR AS POSSIBLE BY AN INDEPENDENT FILE AUDITING PROGRAM.

Components may, like attributes and functions, be exploded into more detailed sign decisions, at the appropriate time in the specification example DBAUDIT PAR: The audit program shall be parameter driven for selective analysis as to input records, input fields, co-related files, depth and type of analysis and output reporting format and volume."

A design component is listed on a separate design specifica-tion sheet. High level design components are settled on before proceeding to detailed explosion. But you can explode. early, any design component which might be particularly

interesting to explore early.
A design component is noted in several of the Function/ Attribute intersections. It is noted wherever it has a major

will have some impact on one

very much to a system of the levels. It also allows you to work your way into "floor plans and fire protection anaysis" of your system: or the

code in the intersections be-tween Functions and sistency checking of a design cheap to correct errors (by factor of 10 to 100!) and greater programmer productivity is ensured, not in terms of lines of SHALL BE FULLY AND code but in terms of lines of relevant code to the project goals. Less will be rejected by the users and testers for las

moment reworking due to inadequate design. Biologists have their microscopes, astronomers have their telescopes and electronics technicians have their oscilloscopes. I feel that the F/A/C/Table is the key to a software system description tool which we badly need to communicate about our tech-

nology. I call it a technoscope, I believe that we all need it. for non-trivial projects, in addition to lower-level design methods. I believe it is an architect's tool, and that some of us must rise above the useful, but limited, horizon of the programmer-bricklayer and become real design engin-eers and architects. To do this we require similar tools to those in use in other discl-

I hope we find more technology transfers like the F/A/C/ Table to help us master the

AN interactive financial model ling package designed and de-veloped in Sweden is being mar-keted by ICL Dataskii for ICL System Ten equipment. The software, Prosper Ten, provides similar facilities to the existing anniar, recurries to the experients of 1900, and 22903/4 vepsions of Prosper, though it is not compatible with these products.

manpower).
A F/A/C/Table correspond:

In a Compass system, application jobs are allocated to particular processors at an early stage in the design process, according to the function to be performed. Processors would typically be dispersed geographically, each in proximity to the plant equipment it is to con-

In a Demos system, the corresponding design step is the allocation of operating system tasks to particular processors.

Thus each processor in a processor. operating on networks of microprocessors and both are suitable for applications such as general hold a complete conv of general hold a complete copy of real-time plant control, there are few other similarities between generally dedicated to a single age, the design includes operating system task.

Demos, Compass:

comparing the nets

PROGRAMMER NOTES

(CW, July 20) and the NPL's

Demos project (CW, June 29). A key distinction is that Com-

pass is a loosely coupled multi-

processor is programmed

Demos on the other hand is a

tightly coupled system in which

all the constituent processors in

effect-make up a single com-

puter. It is programmed as one

These major architectural differences are accompanied by order of magnitude differences in the volume and rate of data exchange between processors. Data exchange in Compass is

essentially restricted to the passing of control parameters between related tasks. Invisible to the user, system mechanisms automatically update the local data pool for each process at regular intervals with relevant values extracted from other

slow, being governed by the needs of power station plant. A specific benefit of loose coupling in Compass is a degree of system resilience. Should one processor fail, it will be feasible to revert to local manual control

The frequency and speed of such exchanges is relatively

of that function. Another significant feature is Processors would typically be that programs can be modified localised geographically and in a running system. This blance to the Marconi system. tasks would be assigned bet- capability is based on an interween them according to the active editor and compiler which natural parallelism of the pro- can be run concurrently with

Users of Compass will vary widely in their appreciation of specific protection mechanisms, discriminating - for example — between privileged and non-privileged users and permitting access to facilities

Together with facilities for data protection, these mechan isms will make possible the construction of robust systems in which jobs cannot interfere with each others' resources. The system will also include

built-in error tracking to ensur that error conditions arising from data do not affect plant outputs adversely or give min leading results.

Specifically designed to be easily portable, Compass differ in this respect from Marcon's Locus 16 distributed processing system (CW, August 8, 1974) for which the company designed in own 16-bit hardware modules under the Alp-1 project. The only for air control application

One possible future develop-

ment is to implement com-

munications management as a

scatter/gather mechanism

built-in to the hardware. The

approach would entail splitting

euch processor into a pair of

pose machine, the other

If adopted, this architecture

would implement all kerne

functions, including the inter-

special purpose microcomp

Concurrency requirements rule out Coral for Demos

THE choice of Concurrent duplicated in each processor. Sysgen procedure. Pascal for the NPL's Demos system further emphasises the significant difference from Compass, which is to be written entirely in Coral 66.

Concurrency requirements ruled out the use of Coral as the principal implementation langu-

making it more difficult to write reliable programs, and it suff-

ered from its relative age.

The team was, in effect, left with the choice between Concurrent Pascal and Modula as a system implementation langu-

has moved to new omces at 1 Tony Hears at Oxford, Concur-Church Street; Stourbridge Frent Pascal was developed by West Midlands DYS 1LT. Tel: Brinch Hansen at Caltech in the Tony Hoare at Oxford, Concur-system tasks to processors is US. His is still the only Concur-

rent Pascal compiler in Originally developed for the software. Demos currently supports programs written in sequential Pascal but may later the territed at execution time by the karnal resident in each arm. interpreted at execution time by the kernel resident in each pro-cessor, see Figure 1

In addition to the interpreter, the karnel contains low level A BRANCH office in Swindon be written in Pascal The kernel Birmingham based firm, Gould which the Argus 700 f. Rose Computer Systems, at 159 Victoria Road, Swindon, Wilts Tel: specifically designed

software is specific to the processor on which it is running. The level immediately above, which is referred to as the application support environment, comprises high-level operating system tasks, written in Con-

This includes routines for heduling and job processing, disc file access, database management, and terminal

The allocation of these tasks to particular processors is performed as part of the system generation (Sysgen). Processes

Demos designers note that the system is particularly intended

preter, in hardware.

<u> </u>	Application software	. Sequential Pascal
	Application support environment	Concurrent Pasca
	Kernel (executive)	Coral
. 1	Computing hardware	
	Interconnections'	1
lențic	al on each processor	

Based on Wirth's Pascal and Figure 1. Organization of a Damos process

tion software, routines are assigned dynamically to appro-

shake protocol. Inter-process communication is programmed as a simple procspecifically designed. edure call, which is converted to Above the kernel, which is an inter-processor call by the

At system generation, alternative versions will be created which will increase the number of processes supported on each

EDITED BY PETER HEWITT

First Euro order for Trax

European order for Digital Equipment's newly released Trax TP monitor (Software File, June 22) has been placed by Gamma Associatos. Gamma's client, Clive Discount, a leading City discount louse, changed an existing order

techniques and available on

Digital Equipment PDP-11 and

IBM System 3 equipment, has

been launched by a specialist

RPL, Replacement Program-

icomputer implementation

ming Language, is a super-set

of the popular Filetab and FTL6

packages now marketed by the National Computing Centre. Written by the chief designer

of these products, Tom Barnard,

it will be sold and supported by

Filetab Support Services, a

centrated on Filetab and FTL6

Already running at some

twelve test sites, the PDP-11

version, designated RPL(11M), runs under all major operating systems, including RT11, RSX, RSTS/E, COS350, and COS500.

It will also run on micro systems

based on the LSI/II, and on

Due to be formally released in about six months, the IBM ver-

sion will be supported on System 32 and System 34 machines in

A fully compiled language.

RPL(11M) offers major advan-

tages both in speed of execution

and speed of program develop-ment over its chief DEC rivals, Basic-Plus and Basic-Plus 2. Fully compatible with PDP-11

file formats, the most basic use

of RPL is a report generator

from existing Cobol or Basic application files. Inbuilt multi-

evel control breaks, automatic

totalling and multiline tabula-

tion are among the facilities

The language is also appli-

route

when

long

upon

fans

with

Illes

THIS diagram represents a chessboard with a 64-word message inscribed "move by move" on a Knight's Tour, The message starts at The and finishes on 260.

This week's problem is to trace the route, whereby the Knight

been

chess

first

good,

260.

Kt's

Puzzler

and

. by

only

clubs,

One

See page 45 for solution.

sits each square once only.

260

addition to the System 3.

consultancy services.

PDP-20 systems.

UK software company.

that the main advantages offered by Trax are speed and economy o applications development, automatic error recovery features and inherent application

Decision table-based

complex application systems. In

addition to instructions for cha-

racter string handling, indirect addressing and table look-up, it

access methods, including

indexed sequential organisation.

site, RPL's variable length

chained file capability enabled

the development of a complete

Not restricted to batch opera-

tion, the system offers facilities

for screen handling and data

input validation for online

applications. It accesses

mechanisms for locking out

concurrent file update attempts.

An interesting feature of the

package is that it includes its

operating system, and including the RPL language compiler, this

software is responsible for

eliminates restrictions on pro-

memory partition on the PDP-11

gram; alternatively program

Programs typically begin with a series of dictionary state-

on to file record layouts. A cen-

tral source code library and

facilitate the incorporation of

statements may be entered to an

standard DEC operating system

bill of materials processor.

At Airfix Industries, an early

language for PDP, IBM

supports a variety of disc file required, however, to deal with

chained record, hierarchical and file structures, and the company

own virtual storage run time rewritten in RPL; it subse-

system. Running under the main quently ran in about five

paging user programs in and out of memory and effectively time from 20 minutes to 20

Interface for Shadow, Librarian from CAP AN interface between ADR's Librarian (system can work online under Shadow,

ding to installation require-ments. For a typical LSI-11 sys-

cites around £1,400. For a large PDP-11 running under RSTS/E,

the price rises to about £7,000.

The company has already

attracted worldwide interest in

the system, for which it sees a

months been marketing the

software under licence (Soft-

ware File, March 23). Gamma,

the DEC minicomputer specialist is also using RPL; Gamma

Products Group currently offers RPL on its Olympic family of

microcomputer systems.
Filetab Support Services is at

the moment reticent about plans

to market in the US. It is under-

stood, however, that a number

of US software houses have

made approaches with a view to

negotiating agency agreements.

Filetab Support Services is based at 116 Brompton Road,

London, SW3. Tel: 01-589 4986.

Europe, SPL has for some

very large sales potential.

has been developed by Computer Program Task/Master, and Datacomm. comprehensive archiving capability.

source program retrieval and maintenance retained with the program.

into user programs.

RPL will compile all existing

Filetab and FTL6 source.

Modifications will usually be

differences in data formats and

notes that existing programs

will not make use of all the fea-

Benchmark comparisons

against Basic-Plus have given

impressive results, both in com-

pilation speed and speed of

execution. Compiled RPL pro-

grams are said to run at least

four times as fast as Basic-Plus

in about half the core and to

compile about three times as

fast. In one test, a 500 line program

suite written for a PDP-11/40

was reduced to 30 lines when

minutes as opposed to 40. A ma-

jor contribution is made by an

efficient sort routine, which in

The purchase price of the

this case reduced processing

tures of the new language.

Online and Altergo's Shadow TP mointer. Librarian already offered interfaces to Cics. up to 255 versions of a program, any of

DEC signs up

Nastran

THE structural analysis pack-

age, Nastran, originally deve-loped under the direction of

Nass, is to be marketed as part of its software product range by

puters and are likely to be con-

vorted to run on the new Vex

structural analysis package known for its simplified user

known for its simplified user interface, was developed and is supported by the University of Southern California. Nastran Is supported and marketed by MacNeal-Schwendler.

The announcement follows Atkins' implementation of Assafor the DECsystem 2020. Assafor the DECsystem 10.

also runs on the DECsystem-10 and may be adapted for Vax (Software File, May 11).

DEC's Engineering Systems
Group has also announced new
word processing capabilities for
the IAS, Vax/VMS, and Tops-

10/20 operating systems. The new facilities are functionally

equivalent to the Document Ex-change utilities already avail-

able for RSX11M and RSTS/E.

Sap VI, the latest version of a

Products, the software products arm of A particular benefit of the new Librarian CAP-CPP. CPP has also announced the latest release of Librarian, which features a describes as "total retention." This means that all changes made to a source program at The new interface means that users of the any time during its life can be permanently

The system provides for the retention of which is instantly retrievable. Also retained is information regarding the type, date, time, and level number of each update

All of this information is kept within the source program itself, which is subject to the Librarian's compression algorithm. The eventual size of a program is determined by

the number of times it is undated ind the number of statements added durings its life.

Archie operates on both disc and tape master files and allows programs to be switched from archive control to normal processing if required.

CPP notes that the new fea ture allows the elimination of all manual source program maintenance activity. It also provides a full program modification audit trail, including the physical data records corresponding to each

Digital Equipment Corp. OEC has also signed a marketing contract for Sap VI. Both packages are now available on DECsystem-10 computers and are likely to be seen **Manchester office**

A BRANCH office in Manch ester is to be opened by Systems Designers Ltd, the Surrey-based computer systems consultancy The new base — at 40-42 Washway Road, Sale, Cheshire will complement existing SDL activities in the North-east, notably a recent £627,000 contract with British Steel at Redcar

Turnkey system

A COMPLETE turnkey accounting system, worth £130,000, is to be developed by Haven (Computer Services) Ltd for the National Supply Corp of lbya (Nasco). The hardware is a 64K CMC Reality system in the Royale version, incorporating the new firmware and Release 3.0 of the operating system.

The monitor occupies an 8K software varies widely accorand requires 96 disc blocks. RPL is input at a terminal improving using free format statements. A direct input option allows for online syntax checking of a pro-

ments, mapping data names A SYSTEM software package which can substantially improve the throughput of IBM DOS/VS Copy statement are provided to has been launched in the UK by Westinghouse Mangement Sys-tems. The product, Fast Tran-sient Loader (FTL), enables users to make specified B ransients permanently resident n main memory

Developed in the US by Goal Systems, FTL achieves its effect by reducing contention on the system residence volume SYSRES) and by freeing tranlent areas more quickly.

When any transient is to be fetched into either the logical transient area of CRT transient area, FTL will determine whether the phase is resident in storage. If it is, it can be moved directly to the transient area, eliminating the need to read the core image library Any number of B-translents.

including DOC or CRT transients, can be supported by the system and can be placed either in real or virtual memory. The system requires a minimum of one 2K page of real storage in which to hold execution code and a directory of resident'

To facilitate tuning, the soft-ware provides statistics of tran-sient loading activity, one detailing references to resident phases, and the other listing the most-frequently referenced

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Westinghouse estimates that FTL will normally save between 30 and 120 milliseconds for each transient load. Thus on a typical If the relevant squares are numbered 1 to 64 in sequence, all eight vertical files add up to 260, so the tour is not without theoretical load estimated at 5,000 loads per hour the package can save any hing from two to 10 minutes pe

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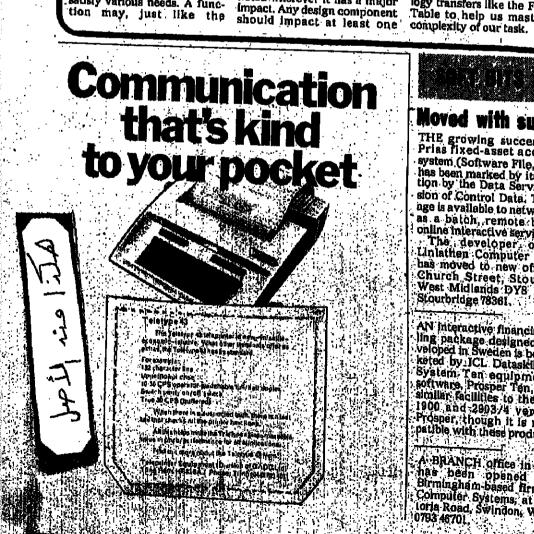
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Moved with success

THE growing success of the Prias fixed-asset accounting system (Software File, April 20)
has been marked by its installation by the Data Services Division of Control Data. The package is available to network users as a batch, remote batch. or is a batch, remote batch, or 20)

online interactive service.

The developer of Prias incorporating work on the noLiniathen Computer Services, tion of monitors by Professor

current Pascal. age for Demos, according to a okesman for the joint NPL-Scicon team working on the

Although Coral was attractive from the point of view of standards and availability, the absence of constructions for

handling parallelism was a ma-jor deficiency, he said.

The language was also less multiplexed on a single processmaking it more distinction.

sor, by making more than one process resident.

for applications which divide naturally into co-operating sequential processes. This would include such areas as plant an process control, database pro-

software /	Sequential Pascal Concurrent Pascal						
Support ent							
cutive)'	Coral						
lardware'							
tions	1						

The allocation of operating cessing, word process

essentially static. At the highest level, applica-

support applica.

To tran linerconnections between the processors, electrically a single system dynamically should on the bust Based on executive level bassed using a three system should be rentily bassed using a three systems. passed using a three-way hand-

munications, and interaction terminal services. Specific advantages of Demos

include the fact that it is easy to expand in the field, that expand sion can be smooth, with an discontinuities in the price. performance curve and that the

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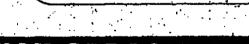
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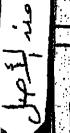
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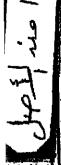
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THE RESERVE OF THE PERSON OF T

Megabytes on disc, a 300 lpm printer and

System 800 Ltd is a subsidiary of Cattle's

Holdings, a Holl-based group with a turn-

over of nearly £40 million a year and inter-

ests in consumer finance and insurance

Cattle's owns one other computer firm,

Hadrian Computer Services which like

the UK General Electric Company mard recently is that of Angus Ogflyy, who becomes a nonexecutive director Robert Clayton and David Powell become executive

Clayton, GEC's top micro man, has been with the company since 1937 He has been technical director since 1968, and is also a director of GEC Management. His career has included the managing directorship of GEC Electronics, 1963-6, and of GEC Research, 1968-68.

Michael Pye has become managing director of Sinclair Radionics He was technical director of the company from 1973-76, then moved to Gillette in Cambridge, Massachusetts to become director of dectronic development, responsible for electronic appliances, clocks and watches and smoke delectors.

John Duffy, corporate vicepresident of Fairchild in the US, has become general manager of the discrete products group, and is suc-casted as head of world-wide send-conductor marketing by division vice president Andrew Procassini.

Frank Ferrett, formerly technical manager with the Communications Centre 1td, has become field sales

Boat Trip

A boat trip on the Tinmes is being held by AiCS, the Association of Independent Computer Specialists, on Wed-needay, August 9.

The trip starts at 7.00 pm from Tower Pier and returns at about 11.00. There will be music and dencing and a buffet

Tickets are £5.00 from AICS Headquarters, 8 Leigester Street, London WC2, tel 01-437 0678.

He was chairman of the Electrical a traince programmer. Engineers' Association 1966-7, and of the IEE Electronics Division. 1968-9, and president of the IEE from

ees for research in electronics.

in 1969 and managing director of GEC Diesels in 1971.

Michel Guy becomes marketing

manager for Hughes Microelec-tronics. He will be responsible

throughout Europe for the products of the Hughes divisions at Wey-

bridge and Glenrothes, and will head the Brussels and Paris offices. His

most recent job was as European

military and nerospace marketing manager with National Semicon-

ductor, but most recently he has

been attending INSEAD, the

European business school at Fon-tainebleau, where he qualified as

Muster in Rusiness Administration,

a senior systems analyst with Nehanga Consolidated Copper

Mines in Zambia, has become a sys-

tems engineer with Cincom Systems International in the UK.

of the Northern software centre of Philips Data Systems, in Manch-ester. He was formerly a systems officer with the Co-operative Bank.

AT the AGM of the Institute of Data

Processing Management, West of London to Oxford branch, the chairman, J. C. Nunn, was elected for

another year. A further two committee members

Derek Hurrell and Colin Bendall

were elected; otherwise the membership of the committee remains

IDPM committee

lan Fleming has become manager

Robin Hamilton-Jones, previously

Stuart Pope, formerly a marketing executive with Computer Systems and Programming, has joined Strand Computer Systems in a similar 1975-8. He has served on various government and industry commit-Powell has been assistant general manager of GEC Power Engineering and assistant managing director of GEC Telecommunications. He be-came director of industrial planning

Bert Fensome of NCR has been appointed district manager of the commerce and industry division. Previously he was vocational services manager with responsibility for systems and programs services and for the marketing aspects of commercial application software.

George Tannous, previously mar-keting manager for the Middle East and Africa with Memorex in Brussels, has joined Itel International as director with overall respon sibility for the management of the company's activities in the Middle East, Africa and India.

John Clifford, Joe Hazelwood and Malcolm Webb, of computer stationery printers inchbrook, have been appointed to the board. Clif-ford, who was formerly works manager, becomes works director, sales and commercial manager Hazelwood becomes sales director, and Webb, previously financial manager, becomes financial direc-

Liveware File

WHAT'S THAT RED SAIL

IN THE SUNSET?

Peter McPoland has joined Jenson Computer Systems as senior pro-grammer. Previously he was a pro-grammer with Unigate and Rolls Royce. David Haines joins Jenson as



ols held recently by the in-AUGUST 6-9

dustrial computing bureau GMS
Computing as part of Sheffield
Science and Technology Fair was
won by the team from the Henry
Fanshawe.School, Dronfield.
The teams in the first had to find The teams in the final had to find the best routing schedule for transporting containers from Shef-field to York. The problems were rammed in Basic by GMS, the contestants used the IBM Call System to help them.

In our picture above Martin Chatwin, GMS managing director, presents the GMS Trophy to the winners, (left to right) Mark Ash-ton, Peter Ashforth, Ian Alliaon,

INMOS CHIPS PROM

SILICON VALLEY ...

Bob Monte, until recently vice-resident of field operations with Itel international, has been promoted to executive vice-president of the field engineering division. Conference on parallel processing.

Computers, communications and tech-plogy transfer, Jerusalem conference on

Information Technology Information Processing Association of Israel/IEEE AUGUST 23 **AUGUST 9**

Boat Irip. Association of Independent Computer Specialists. From Tower Pier, London, 19,00. Tickets £5,00 from AICS. tel: 01-437 9678. AUGUST 21-24 Operational data security workshop. Operational Data Security Corp. City University, London ECI. Register August 18: 01-283 4399, ext 347.

AUGUST 21-25 Cybernetics and systems fourth inter-national congress. World Organisation of General Systems and Cybernetics Anistordam, Details Dr J. Rose, College of Technology, Blackburn, tel: 0254 64321. AUGUST 22-28

HOW LONG DIA

THE VOYAGE ...

Meeting. VM UK and Ireland User Group. Maldenhead. Details from Ids Stinson on 01-589 5111, ext 2700. AUGUST 23-25

Siggraph 78, fifth conference on one puter graphics and interactive techniques. Association for Compute, Machinery, Atlanta, Georgia, USA. AUGUST 28-SEPTEMBER 1 Eighth Australian Computer Co

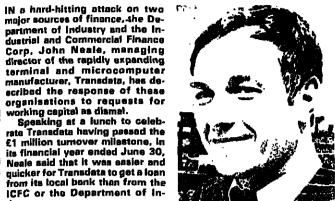
ference, Australian Computer Sodes AUGUST 29

... TAKE YOU THIS

TIME, BRENDAN?

months to the go sheed and strings would propably be attached — like ICFC wanting a Jackson design technique, monet ment tutorial. Marcus Bromberger, Des of Computer Science, University of share in the company. Neele said that the Dol was Strathelyde. Glasgow. 9.30. Details hes the Continuing Education Office at the University, tel: 041-552 4400, ext 2132. eally interested only in lending money for product developm and not in providing working

bu Don



established and highly profitable, can increase its overdraft at its local bank by 50% with no more

'Quicker to get a loan

than from ICFC or Dol

from our local bank

the cash even if it agreed to do so. thermal matrix printer terminals, of which there are now 3,000 Installed in the UK and on the Continent, and its other main product is the CX400 micros puter system which comes with a floppy disc storage and can be programmed in Basic. The CX400 is sold by Transdata on an OEM

basis. Neale said that Transdata was capital for expanding production alming for a £2 million turn and marketing. The Doi usually its current financial year.

Name change for info show

THE exhibition and conference Conference, and the organiser, that made its debut in April as BED Exhibitions of Wallington, Info 78 (CW, April 13), is to be repeated next year from April 3/6 at the same venue, the West Centre Hotel in London. It will be called Info 79 — the Business Computing, Word Processing above their heads. BED believes and Information Handling that more people would have Exhibition and Conference.

Transdate, which is now well

than a week's notice, according to Neale. In contrast, if Transdata

tried to get a loan from the ICFC it

would typically take three

This year's show was called the Information Handling and

Surrey, says that many prospective visitors might have identified it with multi-million pound management information systems and decided that it was ised that the emphasis was very much on the practical systems Management Exhibition and applicable to smaller businesses.

BACKED with evidence that competitors, but it is on a lower ICL is better placed to compete. rating than any of these conswith IBM than most of the US panies while having a higher mainframe manufacturers, Lon-

sor and disc Basic operating software, is to System 800 Ltd says that it plans to sell

The processor and memory for System 800 well as selling System 800 to commercial end

are built by Electronic Memories and Mag. users. Under its agreement with EM&M.

netics in the US and have been supplied by System 800 Ltd has the rights to manufac-EM&M to customers there since last ture the processor in the UK if EM&M stops

Ltd of Newcastle-upon Tyne.

32-page in-depth examination of

"The market has taken a very

cautious view of ICL for several

recent successes or future pro-

the company.

be launched by a new company. System 800 the EM&M processor to systems houses eight VDUs.

A COMMERCIAL hardware/software producing a range of applications packages ages will cost £500 each on top of this. The package called System 800 which will cost to handle jobs like payroll, purchase, sales, to handle jobs like payroll, purchase, sales, biggest System 800 configuration will still have a 64K word memory, but will have 40 handle jobs like payroll and HP/credit.

and specialists in the UK on an OEM basis as

System 800 Ltd in the UK has developed a For £10,400 the System 800 purchaser will System 800, is located at Newcastle, Hudrian

disc Basic operating system for the EM&M get 64K words of memory, one VDU, a 60 runs a bureau service on an ICL 1903T and

processor which can handle multi-tasking chos printer and a five Megabyte cartridge writes applications software for machines

by up to four terminals, but not multi- disc drive, as well as the processor and like the ICL 2903 and the IBM System 3 and

Brokers strongly back

buying of ICL shares

don stockbrokers Laurie, "Furthermore, compared to a Millbank have come out with a vast majority of UK industrial companies, ICL's record is very strong recommendation to buy ICL shares.
"We believe that ICL has the impressive, yet the shares also stand at a discount of 35% to the right combination of products. market. We consider that this technology, financial strength anomaly will be rectified soon and that at around these levels, and management to continue ICL represents outstanding growing at an above average rate, and consider that despite On ICL's ability to compete the competition from US companies, ICL has a bright future in

against IBM, the report notes that ICL's foreign turnover has risen from £60 million in 1973 to data processing." say the brokers at the conclusion of the £212 million last year, giving it second place to IBM in the non-US world market. It also gives a table purporting to show that last year. ICL's sales worldwide years, which we feel does not grew faster, at 45.2% than any of adequately reflect either ICL's the major US manufacturers spects. ICL has grown faster and apart from Digital Equipment, which had 43.8% growth. has been far more successful in

that ICL's growth was dramatically increased by the inclusion for the first time of Singer sales in its total. Even so, the comparison is noteworthy in that

growth stakes, improved only The report is enthusiastic advanced architecture in the about ICL's technical performance, saying that the 2000 series hardware exhibits "exceptional versatility and power" and that the software utilises

cepts. It also believes that while the 2000 design concepts are valid throughout the 1980s, the US manufacturers will have to undertake very substantial product developments over the next few years—and to substantiate its claim that ICL is strong in basic research, points to the Distributed Array Processor.

"very advanced design con-

Honeywell, number three in the

A further major source of financial strength identified by the report is that "ICL's return on capital employed is higher than that of any of the major computer manufacturers except

The report is bullish on ICL's 2900 series. "The majority of 2900s are still

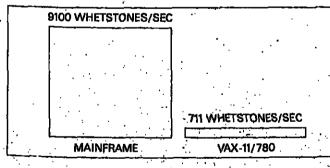
in their first version," it says. "Against this, IBM and the US majors have computer architecture dating from the 60s, which has already been enhanced so much that there is little potential for further improvements. Hence, while ICL can probably double the performance of the 2000 range by enhancements, to get significant improvements, the competitors will need to introduce new products." This analysis ignores the NCR 800 series, particularly the Crite-

Digital's VAX-11/780 takes on the world's leading scientific mainframe.



And wins two rounds out of three.

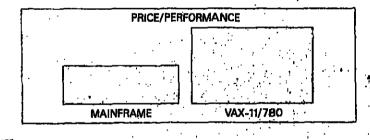
Round one to the 60 bit mainframe: **Speed.** The mainframe is still the speed champion with 9100 Whetstones per second.



Round two to VAX: Price/Performance. The 32 bit VAX is the world's fastest mini.

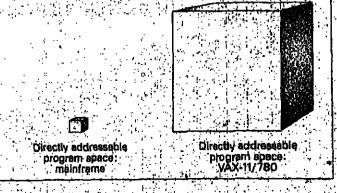
· A VAX system runs 711 double precision Whetstones. That's one twelfth the speed - at one twenty-fifth the cost. A dozen VAX systems could equal the throughput of the mainframe system and you'd still save literally millions of dollars.





Round three to VAX: Program size.

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A good servant,

a bad master

By Bernard Allen

Danger of no real employment policy

should be adopted by the introduction of a nutional dividend? Holders Hill Road. 2. It will be necessary to accept London, NW7.

To: The Editor, Computer Weekly, Dorset House, Stamford Street, London SE1 9LU

that they are a natural develop-ment of Soviet society, but its fountains, woods and hills of the

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Time Programming System).

system? They are here now from Gamma.

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Peculiarities of job ads 'quite amusing'

THE peculiarities of the English language can be quite amusing at times; the peculiarities of the job titles given in some of the ads carried in the computer press can be both puzzling and

Computer Weekly on June 22 carried an ad for Real Software

for the common good.

There is no doubt that Tolya S

has betrayed this ideal; "Next

year in Jerusalem" (a very hot

and dusty town, which I hope to

be in myself in August); is cer-

tainly not what I am trying to

defend when I say he should

Rather I think he is a young,

capable scientist who may make

extensive contributions to the

theory of pattern recognition.

te will not do so in a Soviet

prison. He should be allowed to

emigrate for the good of man-kind. His psychological con-

ditioning makes it extremely

unlikely that he will ever again

Yet it is the Soviet people who

need to learn the lesson of his

Marxism is basically an

empirical science, and must, as such, allow free criticism; if that

is damned, an unhealthy situa-

tion arises in which the

scientist - who normally looks

for a safe haven within society

of which he is a member,

privileged by education and

opportunities—turns against his own society and becomes a wolf within the fold instead of a prize

sheep. Even in the UK where critic-

ism is much more free and lawful, developments within the

divorce courts and an over-rapid

change from a patriarchal sys-

tem to what is beginning to

amount to a matriarchy, have

produced stresses on the under-signed which make him feel he

understands Tolya Scharansky

I therefore endorse particu-

larly the view of Andrew Young,

who also has seen a society from

its worse side. It is necessary for

the Soviet leadership to analyse

Hence, I particularly welcome

this universal phenomenon with

the criticisms of the judgment by the Italian, French and British communist parties; criticism by the Spanish party

may be taken for granted. We must not allow over-

enthusiasm by philosophically ill-trained members of the KGB

to push Mankind back to the

KURT METZER

only too well.

the utmost care.

dark ages.

Wembley,

feel himself Soviet.

dissent most.

In the Fortran sense, Realis considered a type, as opposed to integer or Complex. But Real can also in the Fortran sense be either single precision or double

Engineers. This would seem to

be an ambiguous title, and several possibilities spring to

The title would have been much clearer if it had been specified as Double-Precision Real Software Engineers, or Single-Precision as the case may

If the ad was intended in the Fortran sense, it can also be assumed that the company concerned did not want a whole number of applicants (part-time perhaps?), and that they must not be complex in nature.

The word Real can also be seen as opposed to Imaginary, i which case it is possible that the requirement was for software engineers who actually exist and are not some figment of the magination. Or perhaps those who know they are software engineers and not only think that they are.

If one reads further in the ad, the puzzlement becomes even reater, since the specification ere is for Real Time Software Engineers. Perhaps someone could explain to me the significance of this, since all the software engineers that I know consume real time in order to produce their engineering pro-

ARNE ROHDE Complex Program Engineer

'Offensive photo protest

FOUND your story headed Model welcome for first 2950 Model welcome for first 29t (CW, July 6) and the accomp

nying photograph, offensive.

Am I to assume that Computer Weekly condonas sexist advertising in the computer industry by publishing this photograph on its front page?

C. M. de in MAHOTIERE (Ma) lepartment of Psychology, linkbeck College,

I felt that the photograph was an unusual variation on the "order delivery" picture, summarising both the system used and the application. The use of an attractive female in a photograph does not in itself constitute "sexism" and itself constitute "sexism" que items in our editorial columns

advertisers or vice versa.

The Advertising Standards
Authority provides guidelines on what is and is not accept able in advertisements -EDITOR.

are not meant to be a guide t

Guilt-free leisure

I. WHITE (Letters, July 13) is right. We should hook forward joyfully to the lessening demand for labour. A greater problem than adjusting the economy to meet this change is that of altering attitudes to the work ethic.

It is not easy to persuade mil-lions of people who derive great self-respect from the importance of their work that they are really only indulging their own social needs

To expect labour unions to aid in preparing their members for the change is berhaps being naive, not just because some of their more active officials get their kicke from "organising" and the nower that stems from

it. The less important work be comes in the life of individuals, the less power will derive from

A better vehicle for preparing for the new life s(y)e is the education business and contrary to the unions, it stands to gain in stands to

gain in eignificance.
The vast amount of guilt-free leaving in the future will enable people to fulfit themselves make completely, and one means is adult education in the wides.

But, as Mr White suggests, peoples liberation comes with out preparation it may come KEN WHYLD

Infotech Operations Ltd.

IBM share of world base on the increase

IBM'S share of America's worldwide computer base is on the increase, according to Charles P. Lecht, president of Advanced Computer Techniques. His analysis is based on soon-to-be-published figures from International Data Corp and the work of his company's Technical Analysis Group.

According to Lecht, the value of US-made computers installed worldwide Increased from \$56,000 million in 1976 to \$76,800 million in 1977. This increase of \$20,000 million, or more than 37 per cent, includes sales and ifsold value of systems that were rented or leased. The total encompasses general-purpose computer systems, including

lurge minis and all mainframes. Of that total, IBM's share of the 1977 base was more than \$54,000 million, or 71.1 per cent, up from 68 per cent in 1976. Honeywell slipped from 9.5 per cent of the US-supplied base to 7.5 per cent, a change that Lecht attributes to the sale of some interest in Bull to the French. Univac held 7.5 per cent of all American computers in 1977. approximately the same share, 7.6 per cent, it had in 1976.

Burroughs built 5.8 per cent of all US machines installed worldwide, and maintained its share throughout the two years studied, CDC, however, slipped from a 3.8 per cent share of the base in 1976 to a 3.4 per cent share in 1977. Lecht believes that the network to which it is conthe company made up for any nected.

share of the computer base.

Lecht cautions that th

Active and passive

slippage of its installed base by increasing its services and other Trailing the pack, according to ACT's analysis, was NCR,

which had 2.3 per cent of the 1977 base, down from 2.8 per cent of the 1976 figure. Lecht believes NCR will have a brighter future than the figures suggest. DEC which sells mostly small systems of relatively low value, maintained its 0.7 per cent

While the industry's base grew in value by 37 per cent, inflation, according to Lecht, may account for half of the

changing definition of com puters and the changing mix of goods and services in the business make the 1977 numbers "less correct than they ever

A NEW serial data analyses from Hewlett-Packard called the 1640A can be used both actively and passively. When passive, i can be connected to an RS232C (V24) interface and monitor and record both the transmit and receive data. When active, it can simulate a computer, modem or terminal, and can interact with

GOVERNMENT COMPUTING

HM Customs and Excise. London

A two-terminal minicomputer system comprising 64k 16 bit main memory, magnetic tape unit (9 track NRZ 800 rpi) and matrix printer is required for statistical analysis and operational research work. The equipment is to be installed es soon as possible after mid-March, 1979.

Applications for operational requirements quoting CEH / 7 should be sent to Central Computer Agency, Room 822, Riverwalk House, 157-161 Millbank, London SW1P 4RT

Ministry of Defence

Defence Statistics Branch, Whitehall, London

A small computer able to store and readily access limited quantities of data and perform advanced statistical calculations is required for installation beginning of March,

Applications for operational requirements quoting CEH/6. should be sent to Room 822, Central Computer Agency Riverwalk House, 157-161 Millbank, London SW 17-4RT

Potential Data Control Staff

should attend the Infotech Operations training course Data Control Techniques.

call John Blake for details 0628 35031

OP SPOT

HINT OF THE WEEK

How to find an available disc drive, speedily

THIS week's hint relates to the mounting of discs in the IBM being used.

OS/VS environment.

Under normal circumstances, each time the operator vishes to mount a disc volume he has first to use the DIS-PLAY command in order to find out which drives are

This is particularly timeconsuming when the system has many banks of the units for he might have to repeat the which the volume is to be command several times before

operator who contacted Op

work the operators have to con-

is not all it should be, and in an

we have three printers, two

teletype consoles, a card punch,

a tape reader, a tape punch and a

graph plotter. This makes for an

shift leader, a female operator

and himself have all suffered

from headaches while at work.

and he attributes this to the en-

about the matter. On one occa-

sion a noise-measurement test

was carried out and the opera-

tors were assured that the level

able improvement".

in a couple of years' time.

operator

The management is fully

aware of the operators' feelings appropriate action.

extremely noisy environment.

tend with there.

Noise levels—how

bad is intolerable?

OPERATIONS staff are often stricted by a tight budget and

expected to carry out their that two years appears to be a function in areas where the level very short time. But when you

of noise borders on the intoler- have to work in the area every

He backed up his argument force under the Health and

"The air-conditioning system trade union, the company must

operator is this:

with a description of his instal-lation and the conditions of June 8).

able - that is the opinion of an day it is a considerable period.

To avoid this, use the MOUNT command, but specify device type instead of the actual address. For example:

M 3330,val=(SL,XXXXXX)

He looks forward to October 1

when new rules will come into

From that date onwards, pro

vided the staff are members of a

to visit your installation. If they

intolerable, they will take the

think the conditions of work are

The system will then scan its list of 3330 disc drives and send the operator a message giving him the address of the drive on

Someone who knows how to use his operating system's facilitles will make operating seem simple, while another who is less technically aware will often give the impression that the job is extremely difficult and haras-

operating system can be a good

servant but a bad master.

Let us consider a situation, in the IBM OS/VS environment, in which the operator might use that system's commands to manipulate the job input and output queues to his advantage. Supposing that out of a shift

comprising three operators, one is absent through sickness and another is at lunch. The operator at the master console is therefore the only person in the computer room, and as such is responsible for all peripherals in addition to the console work.

Of course the operating sys-

tem has no way of knowing form a safety committee by about our unfortunate friend's area measuring about 40ft × 25ft which staff and management predicament, and so it continues can discuss matters relating to the work environment, with a to initiate jobs, call for tapes and discs to be mounted and request view to reaching practical conthat the printers be supplied I have consulted an expert on

with the appropriate stationery.

Before long he will find himself running between the con-According to the operator, a the matter, and my advice to the sole and the peripherals and on returning finding more system Contact your local Health and Safety Executive and get them

requests, and so it goes on. What should he do in this situation? Let's disregard the fact that he should complain to his opera-

great effect: the HOLD and the manner in which the console operator runs his system or. RELEASE commands. alternatively, be used by him in So what's new anyway? many order to optimise throughput and make his task as easy as of you IBM operators may ask Well, I must emphasise that the hallmark of a good operator is not what he knows in theory but how and when he puts that

shortage anyway, and look at a couple of IBM OS/VS com-

mands which he could use to

Firstly, then, he must use the HOLD command to stop the system from taking any more jobs from the input queue, and o prevent it from transferring data from the output queue to

Secondly, he should satisfy all the system requests for tape and disc mounts, in order to keep everything "ticking over". For the time being he should ignore any requests for stationery

Next, he must release all input queues which, according to in-stallation standards, will not request any tapes or discs to be mounted. He should then consider the jobs which will require volumes to be mounted, and reorganise the queues ensuring jobs using the same media will run in sequence or concurrently. After ensuring that all necessary discs are mounted and that the tapes are at hand, he should release the remaining

cerned, he should check that one or two have plain paper on them. and release the appropriate output queues. Output requiring held until help is available.

of noise was not a health hazard. However, soon afterwards maintenance engineers carried out some work on the air conditioning system and he says conditioning system and he says that it "resulted in a consider-The small business But the noise from the peripherals is still a great prob-lem and the operators are to lobby for another test to be car-Computer ried out. Next time they will insist on seeing its results. He attributes the managewith better ment's reluctance to take action to the fact that the computer is due to be relocated to a new area Price Performance He continued: "I appreciate that the management is re-Disillusioned "AT the end of the month I'm going on a long holiday because I'm tired of this type of employment in all its aspects." So writes an NCR Century operators with over four years experience, who in a brief letter expresses his disillusionment with operating particularly gontract work. He turned to contract operating after trying unsuccessfully to transfer from NCR equipment MICROACT NCR equipment. He goes on to say that he is "sick of being treated as the odd-job man" pointing to the fact that contract staff tend to get saddled with the tedrous and less pleasant tasks of operations. He reminds us of the fact that contractors must be pretiperated to move about the confire and long hours. Part of the ACT service from the Computer Company with over 1000 successful U.K. systems aiready hard at work Applied Computer Techniques Limited, 6 Vicarage Road, Edgbaston, Birmingham 815 3ES, Tel. 021-454 2151.



Edited by Martin Banks

FOURTEEN VIEWDATA TERMINALS INSTALLED IN CAREERS OFFICES Series to help managers

A SERRES of talks on audio catsettes to help managers keep up-to-date with developments in omputing has been introduced by the National Computing Centre, Called Talking Points, the tapes are accompanied by illustrations, diagrams, and selfchecking questions, and each session takes about 45 minutes.

Topics of the first tape will be: latroducing microcomputers, computer output to microfilm, database organisation, and computer security. Six topics cost £116.44.

Penril modem

FIRST of a series of modems to be announced in the UK this year by Redifon Telecomnumeations Data Communications Division is the 2400 LSI, made by Penril Corp in the US. The 2400 LSI conforms to CCITT V26 and V26 bis, and has Post Office approval. The modern includes a test pattern generator and analogue and digital look-back checks, it sells for £562.

CAD symposium

A SYMPOSIUM on Computer Aided Design for digital circuits and systems, sponsored by the EEC Commission, will be held in Brussels from November 27-29, 1978. Results of a study carried out on behalf of the Community by Saget will be presented and speakers from the US. Japan and Europe will give papers. Cost will be \$170.

DG profits up 37%

IN the 12 weeks to June 3, 1978, Data General made a pre-tax profit of \$17.9 million, up 37% on the same period last year.

Tailored to fit

UNDER a contract worth well over £300,000, Anker Data Systems is supplying Burtons, the tailoring group, with 441 electronic cash registers for Burtons shops all over the UK. The registers are ADS Omron 573 units.

Banking on a profit NEW YORK Times Information

Bank, the online retrieval service for news and current affairs (CW, March 2) lost \$900,000 in operations last year. This is an improvement over the 1976 loss of \$1,600,000. The paper says it is confident that the bank will ultimately turn in a profit.

£100,000 contracts

AIR-conditioning systems supplier, Wright Air Conditioning (Scotland), has secured two contracts worth £100,000. The Holines Engineering Services of Middlesex, which supplies pipes and valves. The Level 6 to based systems will handle jobs like stock control, sales analysis. first is with Aberdeen District Council and the other with A. R. Findluy, domestic hardware wholesalers of Glasgow. purchase ledger and sales order

support, last servicing. and meeting vetil critical path requirements

Prestel service for young job-hunters tion of Prestel has been launched: an online job advertising service for graduate

systems for paints and textiles

The display is a Digivue gas discharge panel using a 512 by 512 matrix bought in from

Owens Illinois of Toledo, Ohio.

the market are used in conjunc-

tion with computers, but IBM claims that its systems offer ease

of use, sensitivity to dark col-

ours, and ability to take account

of underlying colour.

Other spectrophotometers on

Prestel comes to the aid of student job-hupters.

ACCURATE colour matching is

vital to the textile and paint

industries, and Instrument Sys-

tems Group of IBM has intro-

duced two systems which use

spectrophotometry linked to

ligital computing techniques. The 7841 is for textiles, and the

7842 for coatings such as paint.

Both include a spectropho-

colour analysis applications.

Level 6 based

systems

recruitment. New Opportunity Press, which runs the service and calls it Careerdata, has already installed 14 viewdata terminals in university and polytechnic careers offices, for tudents to use in looking for job

The service will be completely free to the job-hunters, being paid for by the firms whose jobs are advertised. Only the charge for the telephone call will have to be paid for by the university; the terminal is provided free, together with a user number that allows access only to Carcerdata, excluding other IBM introduces colour matching

Systems Group was set up in

January, and is an extension of

the thickness of thin-film

has an alphabetical index that the user works his way through. An employer is allocated as many pages as it chooses to pay for, and can arrange these pages in any way it likes, with jobs grouped geographically, for instance, or by type of work.

There is a standing charge of £150 a year, plus £20 for each frame entered, and Mp every time a frame is accessed. This last charge is the Post Office's

veloped within IBM for its own use. The techniques were deve-loped on an IBM 1130 to measure The system has the distinct hours of arising, and also can be

Pages are selected with a numeric keypad, using a "tree" indexing system; each page shows a list of the pages that can be selected next, as one goes down the tree to get more detail. Each page can hold 22 lines of copy, 39 characters wide.
Jobs on Careerdata can be accessed by three indexes:

employer name, type of work, and application. Each of these

This is the first product introduced since the UK Instrument last charge is the Post Office's, and means that if 1,000 students look at five frames each over the the US group which was estabcourse of a year, the subsequent lished to sell the technology decharge will be £25.

advantage of immediacy, in that vacancies can be online within removed the moment a job is



GRAPHWAREL Buro made a name for quality computerbesed electronic instru-ments expanded into the GRAPHWARE compular market: Wa brought with us those qualities that gyery computer user needs, na pecially these days like a first-rate software support

is a microprogrammed controller dedicated controller appropriate in the computer a processor.

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Heights, New York, have been using a 370/168 to fest a new spiral galaxies. Computer simulation of apiral galaxies. Computer simulations have been fun to find brought about by the redistribution of matter in large numbers of superinove explosions and as our photograph shows, the patterns photograph of the current issue of the Astrophysical Journal.

Says Di Gércia, "Our work should supprishe that seem to suggest that our sun was produced by the affect of a supernova explosion. The formation of stars by such explosions may be a very computer splaxies."

The shape of galaxies

Or Humberto Gerola and Dr. Philip Solden report their results in the current issue of the Astrophysical Journal.

Add-on board for Pet

A SINGLE add on board may memory space and with soon be available from Commo memory partitioning, allows an other language compiler of in capacity up to 40k bytes. This the stand Basic interpretation the provides 31k bytes of uson machine.

Name change

The viewdata terminal is a modified television set connected to a modem. The user associated management is done by the Careerdata staff. calls up the Post Office's online

There are only 16 ports on the computer at Martlesham Heath, Prestel system at present, so where of the many thousands of usage is limited. A new compages of text available, 3,000 have been allocated to Careerputer in London is being added to the system in August, when the number of ports will go up to 200. Cureerdata will then be in a position to provide terminals to other universities, and eventually expand the system to cover non-graduate jobs.

Collecting weather data

TWO Digital Equipment PDP 11/05s are being used by EMI Electronics to collect, store and Electronica to collect, store and process oceanographic and meteorological data relayed to them by the UK National Data Buoy, DB1, which is now onstation in the South Western Approaches, about 150 miles from Lands End.

Daysloped by the Section

Developed by the Seatek Group of Companies, the busy is continuously collecting the data for the benefit of the offshore oil and gas industry and transmits the information and transmits the information to the land via a high-integrity telemetry link. Data will also be made available to the UK Meteorological Office to assist in the compilation of synoptic weather forecasts for the UK.

US boost for X25

● From front page ones for an I/O channel-level

interface, an accompanying power-control interface and, for the first time, a proposed channel-level operational specification for magnetic tape.
This package, which the NBS hopes will be difficult to tear apart, is aimed at saving as much as \$55 million over the next five years in "trimming the cost of buying new computer

peripheral equipment."

The NBS move confirms the prediction of a leading US senator, Fritz Hollings, who has said that the NBS is the focal point of the Government's five year plan to "achieve much closer links between government procureacceptable standards.

Hawker Siddeley £135,000 order

THREE 80K Burroughs B814 Hawker Siddeley Power Engineering, one for each of its main UK offices.

Level 64 picked for ease of upgrading

INSURANCE compaby Hearts of Oak Benefit of Leicester has replaced its six-year-old Honey well 1015 with a medium-scale Level 64/30 mainframe. Citing ease of conversion and field upgradability in the future as reasons for its choice.

SUNNYVALE BASED Amcorp Inc. a subsidiary of Datapoint Corp of San Antonio, Texas, is to be rehamed. Datapoint Peripheral Products Dvision.

MICRO NEWS

Ferranti may enter high-end market

ranti multiply and divide circuit for its F100-L 16-bit microprocessor are expected to be available by the end of this year, and the development could mark the start of a significant expansion programme for the company in the high end of the market.
For the device, in essence a

16-bit slice processor, will be a fast device, with a total elapsed time between sensing an instruction and completing the task, in the range of 7-13 microseconds. Its capabilities will include adding two 16-bit numbers to produce a 32-bit number, and dividing a 32-bit number to produce a 16-bit

In its current form the device is not cascadable, ie it will not be possible to contact two or more together to produce longer word-length processors in the manner of bit slice devices like the AMD 2900 series.

Ferranti, however, is considering such a development for the future. It probably would be

type processors, and by using he company's uncommitted logic array technology, it feels it will be able to develop rapidly the necessary support circuitry.

An obvious early market for such a move undoubtedly would be the company's own Argus range of minicomputers, which already utilise the AMD part.

There is also the possibility that the basis of the multiply/ divide circuit will be incorporated in a revised version of the F100-L itself. The current processor uses a 16-bit serial func-tion unit. The decision to use this approach was taken by the company as a trade-off between its smaller size, but slower operating speed, which is largely compensated by the fact that the unit uses fast bipolar techno-

logy. Such a development would produce a 16-bit parallel version of the processor that could offer a doubling of processing throughput without any technological development.

South West Tech 6800. There are

no plans for the group to enter the field of hardware design as

The work currently being

carried out by the group in-

cludes the development of a

system to control the ordering

nal depots of the company.

micros for data collection pur-

poses for a stock-recording lin-

ear program that is already in

Grand Met sets up applications workshop

THE diversity of potential applications for microsystems within the Grand Metropolitan group of companies has prompted it to set up a micro "workshop" to

develop them. Headed by Ian Fitzpatrick, the workshop comprises the five man Planning and Research Group, part of the Technical Division of Grand Metropolitan Information Processing. It is based at GRIP's Uxbridge bureau, where it has access to an Itel AS/5 and an ICL 1903 for systems development work. The ICL machine is to be replaced in October with an IBM 3031.

Though, in the future, it may consider outside contracts, the group's current activities are solely concerned with applications within Grand Met. These revolve around producing software implementations that run on readily available microcomputer hardware, the current

Low power standby ROM

A NEW 64K bit read only memory has been introduced by Mostek that offers a low power standby mode of operation which is said to increase both a maximum access time of 250 device and system reliability.

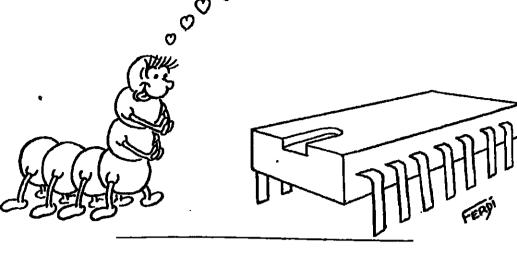
memory requires only a single five volt power supply. It is or-ganised as 8K by 8 bits and offers

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GECS to stay out of any US deal

to effectively double the size of

panding its production facilities.

with new computer-aided design

equipment, test equipment and photomask production equip

In addition, R&D expenditure

WHICHEVER US semiconducvery well, according to Turner. Turnover for the operation is thought to be about £4 million tor manufacturer the GEC group finally deals with in its efforts to establish a joint venthis year, a 40% growth over last ture operation, the move will not year, and the same growth rate is being aimed at for the future, affect the position of GEC Semiconductors as the company's lead house for customthe company every two years.

To help this growth along, the company has spent around £1 million over the last year in exesigned LSI circuits. This was made clear last week

by Chris Turner, director and general manager of the company. There are no plans for GECS to enter the standard product market, where it accepts the fact that it would be possible for it to compete. But the GEC group was obviously interested in the opportunities, and was therefore looking at the possibility of participation with an established company.

and stock of milk delivery roundsmen for a dairy products Although there is no formal corporate policy decision by GEC, Turner implied that any company within the group. Based on an SWTPC system joint venture operation would almost certainly have a UK with two mini floppy drives, it would be installed in the regio-

This, according to Turner, was because it would be unlikely for At an early stage of evaluation is an order entry system that would be involved in a company GEC to want to invest in US technology and leave that techexporting alchoholic drinks, nology solely in the US.
Although the company is not while another development the

group is working on is for using short of financial resources. starting a "greenfield" operation to compete in more than one product area for the world andards market would take a great deal of money over a considerable period of time.

The one company that GEC has been known to be talking to, Fairchild Semiconductor, has no existing UK production facility or any European facility either. The prospect of collaboration with GEC is therefore obviously tempting, in that it might offer Fairchild the chance to establish

a European base.
But, considering the costs involved — there would be little change out of £100 million in all ; bability — GEC's reticence in commenting on just which ably opens the way for speculation on other possible can-

These will obviously include the US manufacturers with UK operations, such as Motorola, National Semiconductor, Texas Instruments and General In strument Microelectronics, all of which are well entrenched in the mass market. The first three would possibly be too big for eyen GEC to swallow easily. GIM however, is smaller, and complements GECS in several complements GECS in several areas in that it has considerable expertise in custom design work and is a competitor in the telecomminications market for such devices as push-button

telephone dialier chips.
A spokesman for GIM however, has categorically denied any talks having taken place with GEC.

GEC itself is now operating

retailing shop for Liverpool

THE computer retailing trend is gathering pace, with the news that another shop is to be opened shortly, this time in Liverpool.

Opening at the end of this

Computer

month, at 25 Brunswick Street Liverpool, Microdigital is currently stocking up a wide range of products that fall into three main categories: dedicated task systems, general purpose microcomputers and support items.

In the first category will be such items as micro-based door bell systems and microcomputer games systems. In the second, Microdigital will be selling kits from Science of Cambridge and Lynx, handling the Mk 14 and Nascom 1 respectively. On the systems side it will have Apple il's the Casu general purpose system, and the Star interactive booking system, running on Mael 2000s.

Support Items will include packaged software from a ques developed for use with 4000 series CMOS circuits. These use variety of sources, including programs produced in-house, a standard set of "cell" strucliterature and assembly equip tures to accommodate the

The company is being run by Bruce Everiss and his brother Alan, whose main task will be to build all the kit demonstrator models. This way they hope to face and overcome the common assembly problems.

MASCOT

this year. Another potential

boost to its growth rate plans is

the introduction of the Cellmos

This is based on CAD techni-

various functions required, held

in a library on a computer. This cell structure allows design en-

gineers to call up the required cells by reference number, rather than "re-inventing the

wheel" each time.

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How India is keeping abreast in DP services

he Tata Consultancy Services of

Part of the giant \$2,000 million a year Tate conglomerate, which makes everything from soap to trucks, TCS has a close roughs, and has formed a joint manufacturing and software company, Tata Burroughs, in which each has a 50% holding. TCS is run by Faqir Kohli, a

soft-spoken, humorous man from the North-West Frontier. who exhibits all the best characteristics of the sturdy independent tribal people from that

TCS employs 250 computer professionals, all with ex- and general ledger packages are

professionally-run computer its turnover has grown from services company in India must \$350,000 in 1968 to \$5 million in 1977, \$1.6 million of it earned Equipped with a Burroughs

B6748 with 512K-bytes of store, shortly to be upgraded to 1.6 Megabytes, a Bi728 with 192Kbytes, an ICL 1903 and two IBM 1401s, it is not surprising that TCS has abundant experience of conversion. It claims that 100 man-years of effort has gone into rewriting ICL, IBM and Univac programs for the Burroughs lic

TCS is also heavily involved in the Europeanisation of US business packages for the Burroughs 880 small business computer. Inventory, receivables, payables

requirements, and a TCS team is doing the work in the UK.

responsible for the lateness o B80 software, and indeed the work done by the company is very highly spoken of within

Burroughs has brought in TCS as subcontractors for many overseas projects, including development of a hospital real time information system and a bank-US, conversion of 1,000 370/145 Cobol programs to B6700 for the City of Detroit, Burroughs' home in Michigan, and an IBM to Burroughs conversion for the Auckland Savings Bank in New

A major conversion job was

Container Terminus in Rotterdam, where it was necessary to convert 200 programs written in Univac 9400 assembly language

into Cobol to run on a B3700. The project was managed in Bombay, took five man-years of effort, and most of the work was done on a B4771 installed in

Some system software, mainly

Cobol and Algol preprocessors has also been written, but the company's forte is clearly in cost-effective conversion. man are \$24,000 to \$30,000 a year overseas, with travelling and living costs extra, and \$15,000 to \$16,000 a year in India, including

The B6700 will greatly expand

undertaken for the European the capability within TCS, but the company is not yet in a anything like its full extent. A few terminals are attached, but the overwhelming workload is still batch. Improvements in the communication facilities in Bombay, the addition of more terminals and the addition of the extra memory should enable TCS to make much more effec-

DECsystem-1077 dual processor

tal Research for the new part-

United Nations Development Programme-funded National

Centre for Software Develop-

ment and Computing Techni-

ques, DEC has picked up a

of intent for large systems.

These include a DECsystem

1090 for the Institute of Science

in Bangalore, and 1020s for

Chandigarh and Roorkee Uni

There are also nearly 100

PDP-11s in India, about half of

applications; one of the pro-

applications tend to be done by

organisations like the armed

done in-house, and the expertise

gained seldom filters through to

DEC's agent in India is Hindi tron Computer Systems and Consultants of Bombay, Hind-

tron is a small company with 20

hardware and 20 software

specialists, providing services on

its own PDP-11/34, and also

acting as agent for Tektronix

With several people trained by DEC in the US, Hinditron pro-

vides maintenance services.

training on DEC operating sys-tems, writes software for DEC

machines, and is keen to do

Cobol and Fortran. It claims that

it can have the right man on the spot anywhere in the world in 48

hours, and that its rates are

one-third of what DEC would

Another small but enter

formerly Poona). Maharashira.

Rayl and Ashok has forged a link with Data General, and is in

the process of importing its own

Eclipse C330 which is to have

192K-words of store and will

in order to get a licence lo import the machine, Ravi and

Ashok has had to agree with the government to export 100% of he value of the machine within

five years. If it fails to do so, it will be fined double the shortfall.

from IBM machines to run on Data General minis. Half of its business is data entry, and it is

also doing media conversion for

US customers. It employs 30

Specialising in software for the petroleum industry, Data Electronics Combine of Delki

employs six consultants, and its main achievement was the de-

velopment of software to simulate oil well performance for the Indian Oil and Natural Gas

professionals.

The company has made a good start, being awarded con-tracts by Data General to con-vert RPG and Cobol programs

support 12 VDUs.

prising company is Ravi and Ashok Enterprises of Pune

conversion work, particularly

forces and the police; they are

lems is that the most advanced

versities.

TIM PALMER REPORTS FROM BOMBAY

Continuing his review of Indian ware houses, notably Tata Con.

Computing 1978, Tim Palmer sultancy Services, best known for

this week takes a look at some of its association with Burroughs,

India's leading bureaux and soft- revealed in CW four years ago.

The association with Tata and the agreement to manufacture sub-assemblies for the B80 for export have led the government to look favourably on Burroughs, and since 1973, the company has acquired a strong nucleus of machines in India. As well as the machines at Tata, there is a B6738 at the Calcutta Regional Computing Centre, a B1728 at the State Bank of India,

tive use of the machine.

The legendary IBM 1401 at Dunlop (CW, June 6, 1974) is finally to be pensioned off and replaced with a B6811 - the programs have already been converted on the 6738 - and Bokaro Steel is also to get a 6811.

and a B4771 at the Agricultural

The latest entrant in the mainframe stakes in India is Univac, which acquired an Indian distributor when it bought Varian Data Machines ast year. Varian V77 minis were marketed in India by Operations Research Group Baroda, and Univac has successfully extended the agreement to cover the 1100 line

Univac's star is very much in the ascendant, and four 1100s should be installed in India within a year: one each for Air India and the internal Indian Airlines reservations systems, and two for Bharat Heavy Elec-

ORG has 200 employees on the computer side, 130 of them trained in computer science. It Installed two V77-200 minis in India before Univac arrived on the scene, and wrote several pleces of software for them, inluding an IBM 1401 emulator, a linear programming package and a GASP-IV implementation. Work under way includes a

text editor, a statistical analysis package and a general purpose

TCS insists that it is in no way responsible for the lateness of B80 software. and indeed the work done by the any is veri highly spoken of within Burroughs.

simulation system, all to run under the V77 Vortex operating system, and two modules for Univac's USAS standard airline protocol handler and a check-in signed to predict at what point signed to predict at what point in an oil well will begin to intermediate.

ORG staff have also worked on a University of installation in fere with the flow of oil, meaning the company has been appropriate to predict at what point in an oil well will be appropriate the company has been appropriate to the company has been appropriate the company has been approprin

on a Univac 1106 installation in Madrid. The company has been exporting software, much of it to the Soviet Union, for two years, and did 30% of its business abroad last year discussions are under way with Univac on possible assembly of V77 minis in lodia and says that Tymshare in India and says that Tymshare in India

Research into television sub-titling for the deaf which shorthand keyboards and a computer would be used to produce text for superim-

The idea is similar to that being studied at Leicester Polytechnic with the BBC (CW, May 18) but with the emphasis on thms rather than large dictionaries.

position on the picture.

The basic principles of both projects are the same: typists listen to the speech of elevision programmes as they are trans-

Dr Alan Newell, feel that as it is not possible computer, owing to complications over decipher a word. The computer storage proper names, the high error rates of the required is also much less. typists, etc. It is better to aim at having output that is understandable, possibly after

some practice, but not standard English.

from Independent Television, Southampton hand keyboards, which produces a unique the Southampton system uses algorithms to University is working on the design of kind of phonetic code. This is translated into produce text that consists of a good many television sub-titling systems for the deaf in English by computer in real time and dissiplied phoneticisms. For instance, played by the Cecfax or Oracle caption "friendly" might come out as "frendli" or facility. The researchers at Southampton, led by keyboarding errors usually produce output that is recognisable, when dictionary systo produce perfect English spelling from the tems have to give up on not being able to

> One important factor that has yet to be studied at Southampton is the acceptability of the sub-titles to real users. This is to come

> > duct and marketing groups.

eminence: after DEC with 41%

come Hewlett-Packard with 14%

and Data General with 10%. IBM

is given 2%, a share estimated to



52 teams at the **Palace**

PLANS for the finals of the Computastars contest at the National Sports Centre at Crystal Palace on September 30 are building up and it promises to be a great day out for computer people, whether they are competing or just coming along for the entertainment.

e entertainment. A total of 52 teams have qualified for a place in the final, 29 men's and 23 women's, and they have all been invited to take up the challenge at Crystal Palgos. Acceptances are already rolling in and the final list of taxonarders will be sublished. contenders will be published shortly along with details of the

QUALIFYING TEAMS

MEN Rank Organisation, Plymouth Wales Gas; Clerical Medical and Wales Gas; Clericat Medical and General; British Steel; Rowntree Mackintosh 1; Rowntree Mack-intosh 2; Platt Sano Lowell; Pro-vident Management Services; Midlend Bank, Sheffield; London Borough of Hounslow; Commercial Union; London Borough of Lambeth; Rank Organisation, Whyteleofe; Robert Home; London Borough of Kensington and Chelsee; Gordon and Gotch; Allied Suppliers; Hami-iros; London, Transport; Midland Bank, London; EMI; Midland Bank, Bootle; MANWER; Department of Employment; Peterborough Data Processing; UCC; Scioon; ICL Scientific Languages; Diversey.

Processing: UCC; Solcon; ICL Scientific Languages; Diversey. WOMEN. Burmah Oll; Foster Wheeler; Rank Xerox; Woohworth; Midland Bank, Sheffield; Provident Management Services; Rank Organisation; Whyteleafe; Commercial Union; Paymaster General; British Relay Wireless; London Borough of Kensington and Chelses; Alliad Suppliers; CASE; Midland Bank, London; London Transport 1; London Transport 2; City University; MANWES; Littewoods; Iniand Revenue; Paterborough Data Processing; Solcon; Eritish Industrial Platics.

doubling manufacticapacity for the mini line.

At Control Data, profits were up a healthy 36% to \$41.2 million on turnoyer up 18% at \$1,300 million. The Control Data com-

IBM will steamroller DEC's entire line'

The article highlights some of

approvingly that salesmen are

paid a salary rather than com-

mission, so that they tend to sell

the best machine for a compa-

business, and they are at the low end of that range right now," Al Mullin, manager for investor world minicomputer market. Digital Equipment Corp would seem to occupy an impregnable niche in the computer industry. relations told CW last year. Yet the company is a perennial target for gloomy prognostica-tions from industry pundits. DEC's strengths, and mentions

Latest in this line appears to be Frederick Withington, of Arthur D. Little Inc. Menlo Park,

Withington is quoted by the one with the highest commis-Wall Street Journal as saying sion rate. However, it suggests rise to 16% by 1981 that, with intensified IBM competition in the minicomputer market (from Series 1), and DEC's expanding line of large computers, the day is rapidly approaching when DEC and IBM will compete in every area.

What will DEC's president Ken Olsen do, he wonders, "once the IBM steamroller goes over his entire product line?"

Much is made in the article of DEC's expanding range of mainframe computers, now joined by the low-cost DECsystem-2020, and mainframes are estimated to make up 12% of DEC's business.

Yet DEC itself says that although its mainframes are growing faster than the industry as a whole, they are a declining proportion of the company's business.

"They have represented bet-

GEC doubles mini capacity

the GEC family of companies, GEC Computers has been plunged into the limelight by use of the GEC 4080 mini in the Post Office's Prestel viewdata system. Already widely used in industrial applications and by UK universities, the 4000 series has been winning a rapidly growing market, and GEC is in process of manufacturing

A second plant is to be opened at Dunstable, Bedfordshire.

CDC, NCR, Honeywell ahead in first half

is booming in the US, but profits at Burroughs' UK subsidiary turned down:

puter business did particularly well in the second quarter with profit up 64% at \$12.3 million on turnover up 21% at \$449.1 confirming the company's confidence in the success of its large-scale Cyber machines (GW-luby 20).

Because of the sale of the Appleton Papers division to British American Tobacco during the second quarter, NCR's figures are a little difficult to untaye, but on any score they to \$2.18 million. puter business did particularly

FIRST half figures from Control Data, NCR and Honeywell Indicate that the computer business operations up 44% at \$39.9 million, on turnover up 7% at \$614 million. The Appleton sale gave NCR a non-recurring net profit of \$110 million, providing the company with an overall extraordinary profit for the half turnover up 8% at \$1,239 million.



When the weather conditions are just right, Julian Nott (left) and Colin Prescott will lift off for an attempt on the world distance and endurance records for hot air balloons. They will be taking with them a Ti-58 programmable calculator from Texas instruments to cope with such things as lift computations, head and weight formulae, navigation conversions, flight time estimates, and endurance calculations. The record attempt is sponsored by British Gas.

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New light on Honeywell relationship with NEC-Toshiba

strategies for entering the world computer market are fairly plain, those of the other major grouping, NEC-Toshiba, have been clouded by their relationship with Honeywell and are

The two companies developed a joint computer line, Acos 77, based on Honeywell's Series 60, but Toshiba has now effectively withdrawn from the large computer business and NEC is

A joint company, NEC-Toshiba Information Systems has been formed in which NEC hus 60% and Toshiba 40%. Toshiba's manufacturing facilities have not been included, but they are now effectively confined to refurbishing machines which come back from JECC, the Japan Electronic Computer

In Japan, JECC is the sole rental agency for locally-built machines, buying them from the \cdot manufacturer and thereafter taking all the lease income itself. If a machine is returned before the contracted period of the lease, JECC requires the manufacturer to buy it back.

Unless these returned machines are refurbished and out back on the market they vould be a dead loss to Toshiba, but the company has ceased to ould new machines. NEC has been a Honeywell

licensee since 1962; computers are about 20% of NEC's business and the company has 11% to 12%

Toshiba signed licence agree-ments with GE in 1963. Honeywell took them over when It acquired GE's computer business in 1970. Computers are only about 5% of Toshiba's business and the company has about 5% of the Japanese market, giving the combined NTIS about 17%, just behind Fujitsu.

"NEC developed the Honey-well 2000 line beyond our limits at the top end and had far more customers than we did," said Duke Sterling, Honeywell vice-

they have developed Level 64. which runs 200-2000 software. further than CII-Honeywell Bull, in order to satisfy these

There are eight models in the Acos 77 line. At the bottom end, the 77/200 is based on the Italian-built Level 62. The 77/300 and 400 match the CII-Honeywell Buil Level 64, and the

The French and NEC started to work together on this: it was a project called P7A, But CII-HB pulled out of the project and

the 66/85 were purely economic." Sterling insisted. "IBM came out with the 3033 and it became clear that all the as powerful as the 66/80 just were not worth it, especially since the life span of the product

seemed likely to be fairly short." The principal differences between the 66/85 and the 77/800 and 900 are that Honeywell was planning to use CML-1 micro circuitry, which requires water mainly in order to have somecooling, whereas NEC and thing to bid for existing cus-

"The reasons that we killed and allowed Honeywell time to rethink its strategy may well have been a blessing in disguise.

Such setbacks are anyway hardly rare in the computer incosts involved in putting into dustry: IBM cancelled FS, Burproduction a completely new roughs dropped its B8700, Uniprocessor which was only twice vac shelved its plans to merge 1100 and 90 series into a united line and Siemens has just drop-ped its plans to add a 7.770. taking instead the Fujitsu M-The Acos 77/800 and 900 were

announced in Japan long before Honeywell announced the 66/85

building up spares, and training people on maintenance would mean that it was not worth bringing them into the US if they were going to be replaced

in less than five years." For the same reasons, Honeywell does not expect NEC to try US in competition with Honeythat they might be sold to a few large multi-national Honeywell accounts, which also have machines in Japan, has not been

The agreements with NEC

FEVV areas of Honsywell's computer business have been surrounded by a many misconceptions and wild rumours as its relationship with its two Japanese partners, Nippon Electric Company and Toshiba. In order to find out the facts, Tim Palmer visited Duke Sterling (pic tured left), vice-president

adaptations, but the costs of well's Level 6 mini for manufacture in Japan. "Initially they are building the Level 6/43, but they will expand the line both up and down. They are at present taking the MOD.

of Honeyweil's Japan, Mexico and Canada divi-

200 executive." While Nippon Electric is entering the US market via its company in Boston, which sells printers and is planning to in-troduce the NEAC-100 office computer, Honeywell, which continues to sell the NEAC III in Australia, is planning to enter the Japanese market

"We also have an agreeme with another of the big siz manufacturers in Japan, Mitsubishi, In 1963, Mitsubishi Office Machinery, MOM, signal an agreement to market Bul products in Japan. They have sold Gamma 10s, G100s, Bull-G 58s and Level 61s, and they also have 10 6000s (the Level 66 predecessor) installed with agricultural co-operatives."

The trading group to which Mitsubishi belongs is 1884; lurgest customer in Japan and as a result, Mitsubishi has been looking more and more b Fujitsu as a partner. In 1976 MOM set up a division to marka medium-scale Fujitsu system and in the process. Fujitsu acquired 14% of MOM.

Ultimately MOM has to start marketing the large IBM compatible Fujitsu M-serlei group, but this has not happened

"We are now negotiating lobust the division of MOM which markets our products," said

"The new company is due to be formed in August; we will have 80% of the shares and MOM will have 20%, because support from Mitsubishi will ke valuable to us. The current managing director of MOM wi be the new president and the company will employ about 201

We will be selling Level 6. Level 64, and Level 66 machines to replace the 6000s MOM ba sold, through the new company
"The machines will be ported from France and the

US; the Japanese tariff against imports is still tremendous, but it is nevertheless just worth being in business there."

Overall, how does Sterling see

Honeywell's collaboration will its Japanese partners? "Up to 1974 or so, the flow a

information was all one way in since then NEC and Townshave have had engineers in our particular and land

Putting Japanese threat into perspective

Japanese threat to the US computer industry, but a close examination of the businesses of Fujitau-Hitachi combine, since MITI, the Japanese ministry of trade and industry, wants NEC and Toshibo puts the threat into perspec-

computer interests, and they are selling into a saturated mainframe market. The arrangement under which machines have to be sold to JECC for coward leasing relieves them of the necessity of building up large leasing finance facilities of their own, but at the same time requires that their market base grows rapidly each year, because the minimum JECC lease contract is only 15 months.

The Japanese market is about 12% of the world computer market, and local manufac-turers have 57% of this. But Toshiba's 5% share means that it has a derisory 0.6% of the world market, and explains why it decided to

NEC, which after Fulltau has been the most

Japanese ministry of trade and industry, wants two Japanese computer lines, one IBM-compatible and the other not. Its 12% of the Japanese market implies about 1.8% of the world market, now boosted by Toshiba's base. Even so, it only spends about #45 million on research and development annually, which is much less than its US counterparts, less even than is spent by ICL, which gets its R&D on the cheap by doing it in the UK.

The enormous costs involved in preparing documentation, training personnel and setting

documentation, training personnel and setting up maintenance facilities make it almost pasible for NEC to enter the world main ome market in its own right. Why then are the Japanese companies

stablishing subsidieries in the US? The explanation may be more defensive than offensive — that all the major US manufacturers are selling hard in Japan, and they need a source of

US in order to stay competitive in their home market. The big missed opportunity for the Japanese was the failure to acquire any of the US companies which pulled out of the busi-ness. Toshiba had links with GE, and Hitachi with RCA, and Xerox and Singer were also flowed to slip sway. By following a closely IBM-compatible

route — and hamessing the genius of Gene Amdahi, Fujitsu does have the potential to become a major force in the world market, and Hitschi, following a similar route and taking itel as a partner is also well placed.

But the prospect for NEC appears to be largely confined to sales of peripherals, small systems, and above all components. It is quite possible that the Japanese will become undis-puted world leaders in semiconductor comt technology. The problem in a computer context is that these represent an already small

instead adopted P7G, which is to Toshiba use air-cooled CML-2s, be compatible with both Level "We are buying some CML-2 and the lines inherited from chips for future products. The CII," commented Sterling. other main difference is that The 77/600 is approximately equivalent to a 66/40, and the

processor from ours." 77/700 to a 66/80. The 77/800 and 900 are the fruits of a joint development project between ioneywall, NEC and Toshiba. We worked together on the conceptual design, and they have made changes since. The machines are what we announced as the 66/85 and then

they use a different input-output

was regarded as a major setback for Honeywell, but it is an open secret that the company is working on a successor to the Level 66 line and, in view of the comparatively small power improvement it offered, the difities with the CML-1 circuit chips which delayed the project

tomers within the government. The cancellation of the 66/85 not really a viable option.

The regarded as a major setback "The machines are basically

compatible with ours, but the communications are different because of their system of networking, and the operating system has been adapted to Katakana.

"It would only take manmonths to make the necessary

and Toshiba consist of licence It has been suggested that agreements extending to 1982 Honeywell might, perhaps inand exchanges of technical ex deed should, take the Japanese pertise extending to 1979. machines as a stop-gap, but Noither agreement is expected to be renewed, but it is likely that new agreements will be signed in such areas as niconductors.

> "Apart from licence payments, we have had a few soft ware products from our panese partners. We got our PL/I compiler for Level 66 from Toshiba and a Cobol package tester from NEC. We take 30 and 60 Megabyte disc drives from NEC for Level 61 and Level 62 and the prices are very competitive even against those

> > nc's Portuguese factory." MPI is a joint venture on disc production with Control Data in which Honeywell and CII-HB

noted by Magnetic Peripherals

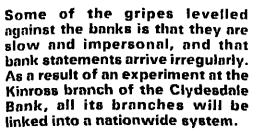
"Otherwise, NEC is a major. source of components, although not a sole source for any item."

Outside the mainframe area,
Toshiba remains in the
minicomputer, office computer
and peripherals markets, while NEC has just adopted Honey- made significant contribu

Calls for papers

PAPERS are solicited for SEECO 78, a symposium and ambibition on Environmental Engineering Today to be held at the Weinbley Conference Centre, Londoy, on May 9-11, 1979. The event is someored by the Seciety of Environmental Engineers for the Robert for the Seciety of Environmental Engineers for the Robert for the Seciety of Environmental Engineers will be selected for their still, to brilled aspects of eavy former, and confineering in relation to both the requirements of hoday and trands for the UNIV. Deskills from the Conference of hoday and trands for the UNIV. Deskills from the Conference Secretary, SEECO 79. Onless Hall Suntangiord, Heria tel-Royamb (0763) 7(208). diffly to brilled aspects of asylvanines of application to brilled aspects of asylvanines of application to brilled in relation to both the requirements of today and temos for the Networks to be field on February, the Conferrice Secretary SEECO 79 Owies Hall Statingford Heris, and Riggs results of Astronomylus Description (70%) 7100 or 10% of Today 10% o

15-16. 1979, in the New Therite, 1979, buurg The theme of the congress of the Commission of the Commission of the Commission of the Spinish Dunning. Commission of the Spinish Communities, Jean Monnet Billing Billing Billing Communities, Jean Monnet Billing Bill



Writing of cheques soon 'thing of past' By Laura Tatham

MORE convenient banking, considerably more sophisticated more personal service and better than any yet announced by any record keeping are among the major British or American services Americans most want clearing bank, has directly from their banks according to a benefited by the canniness with recent market survey by which it has approached com-Citicorp, New York's largest puting in the past. Having, until banking company. Britons, who now, remained aloof from any by now suspect that the long but comparatively primitive promised real time Utopia is a batch operations, it has been figment of the clearing banks' able to cash in on the advanmagination would, no doubt, tages now available through the express similar views if conuse of minicomputers and other low cost components.

Customers of Scotland's As a result, though Autobank Clydesdale Bank (a whollywill incorporate a remarkably owned though largely autonocomprehensive range of facil mous subsidiary of the Midland) ities and fail-safe features, its will soon be luckier than most of total cost will be less than half of us. The outstanding success of a that of a more conventional pliot scheme now in operation at two branches marks the start of The Autobank communicaa project that will put even the most remote of its 368 branches tions network will incorporate 16 Univac V77 minicomputers. These, installed hi pairs at seven

online via a total of 1,500 terminals linked in a countrywide regional centres and at the bank's head office and computer Faster, more accurate trancentre in Glasgow, will cover the whole of Scotland. Each V77 will saction processing at counters and tighter management control will not be the only benefits that serve a group of 15 to 20 dedi-cated telephone lines to each of Clydesdale will derive from its which a total of up to 16 ter-Autobank system. For cusminals in several branches will tomers, its most attractive feabe connected. For the pilot tures are likely to be that the scheme, pairs of V77s have writing of cheques for their own already been installed at one withdrawals and of paying-in slips will be a thing of the past; and that a single magnetic stripe plastic card will be the passport

not only to these but to othe

services such as cash dispensers.

Clydesdale, whose system is

regional centre and at Glasgow. Special hardware and software, designed by Lion Systems Developments of High Wycombe, automatically switches the lines served by one V77 to its

A bank clork at the Glydesdale Bank's Kinross branch inserts the plastic Autobank card into the light-wa Ottopic terminal while the customer (left) enters his pass code on the key pad. The clark initiates the routin through the terminal and checks the customer's identity via its card readers. She then enters the amount and in breakdown.

department, had formulated very clear ideas about system ormance and was convinced that his criteria could be met only by equipment and software more advanced than those designed in the 1960s.

Derek Gail, manager of the

reverts to normal after the fault

Software added by Univac to

the V77 Vortex operating sys-

tem causes each computer to

dump all the records it accumu-

lates onto the disc of its partner

at one-second intervals. Service

will therefore continue without

interruption if one processor

goes down, though response

time may be slightly slower than

the normal 1.3 second average.

Before Fortronic, a small

young Scottish firm and a cus-

tomer of the bank, demon-

purpose designed low-cost ter-

minal, the Autobank project had

has been rectifie

Laura Tatham looks at the sys-

tem which promises, not only to

give faster transaction processing

at the counters and tighter

management control, but also that

cheques and paying-in slips will

disappear. A record of each tran-

saction will also be given.

Discussions with several partner if it develops a fault, and -mainframe companies, however

order." Similar challenges were offered to the other suppliers who subsequently participated in the Autobank scheme. The Fortronic terminal is

For customers, the most attractive fea-

tures are likely to be that the writing of

cheques for their own withdrawals and of-

paying-in slips will be a thing of the past; and

that a single magnetic stripe plastic card will

be the passport not only to these but to other

reached a position of stalemate. you satisfy our criteria we pro-

services such as cash dispensers.

about the size of a portable typewriter and much lighter in netic card reader, calculatortype keypad and control keys, a 6-character visual display, tally-roll printer and microprocessor. A linked keypad is laced on the customer's side of the bank counter and both areconnected to a terminal inter-

Each dedicated telephone-line from the regional V77 minicomputers serves several terminals. minal interface is a combined. branch terminal controller/ nodem. This is designed for the

Control equipment The systems flow chart shows the configuration that will be installed at each of the Clydesials Bank's bra

drew a blank. "Impossible, lines if this is necessary to either in your timescale or at the improve response time. price you are prepared to pay" was their unanimous verdlet. The cost of 1,500 terminals at a minimum of £2,000-£3,000 cach

Fortronic - a company that since its inception in 1970 has looked for organisations with problems rather than marketing standard hardware and software - accepted the challenge to design and manufacture a terminal that fulfilled all the bank's requirements and would cost under £1.000.

was, of course, a major obstacle.

Sentimentality and rash speculation are not characteristics traditionally associated with Scottish bankers and the directors of the Clydesdale are no exception. Though patriotically pleased at the prospect of employing native knowhow and enterprise, they were prepared to do this only on a shared risk

strated its ability to produce a "Work out a solution and install prototypes at minimum cost," they told Fortronic. "If

Designed and built by Lion, this control unit, which also in-

corporates diagnostic indicators, is compact and low-cost. Its function is to scan each terminal for a "request to send" signal and, on receiving this, to lock out the others until the message is complete. It also controls incoming computer messages. Using other special equipment, very small branches will operate as slaves to the nearest larger

At Kinross, one of the two pilot sites, a customer wishing to make a withdrawal or pay-in passes his Autobank card to the teller and names the type of transaction. After he has entered his personal number on the keypad beside him, the teller initiates the routine through the terminal and checks the customer's identity via its card reader. She then enters the amount including, where appropriate, the denominations of

notes and coins. After verification by the terminal the input data is transmitted to the regional V77. A duplicate record is printed on copy for the customer and the

tion detail is logged by th regional computer and remain available for interrogation. In consequence, day-end cashing up is now a quick and simple jo Regional data is also trans

mitted to the head office V77s which accumulate it on mag netic tape. After closing hours these tapes are transferred by hand for batch processing on th bank's mainframes.

All the Univac V77 contro functions are handled by th standard Pronto transaction processing software slightly en hanced to accommodate the Fortronic terminals and other special requirements. This operating under the Vorter ulti-tasking operating systen has contributed greatly toward the remarkably quick develor ment of Autobank.

In a short space, it is difficult to describe the other fallback measures so it can merely t stated that these leave i loonhole. Additional control the network is provided by facility that may well be unic - a video terminal at head offic which permits traffic the terminal tally roll - one monitoring on all lines and, if considered necessary, redistribution of traffic.



When the transaction has been completed, a duplicate record is printed or two-wire SI lines but is capable. filed. The details are elso logged by the regional computer. This feature of upgrading to four-wire S3 makes cashing-up a quick and simple operation.

INTERACTIVE computer graphics for engineers is the title of a threaday course to be held at the University of Leisester on September 25-27. It is intended for engineers already experienced in the use of computers, Details from the Computer Graphics Course Secretary, Dept of Engineering. The University, Leicester LEI 7RM, Tel: Leicester 60000— ask for Engineering Department.

A BASIC aktils division programmo has been designed by infolsen to provide training in the fundamental skills of programming half systems development. Beginners can choose afther Cobol or PL/I basic training and for more specialised application, programmers; OS/ICL and CICS training is available. Further details contact inforce international on Maldeoneed 2003.

A COURSE for the managers of offential user departments has been organised by Kendall-Steath; if will take the form of a

series of two day seminars spread over a period of months, the first being held on October 5-6, and the best in May 1979, in Sirmingham, Details from Mendall Stath, 38 Priory Road, Sheffield S7 ILX. 19; 0742 581871.

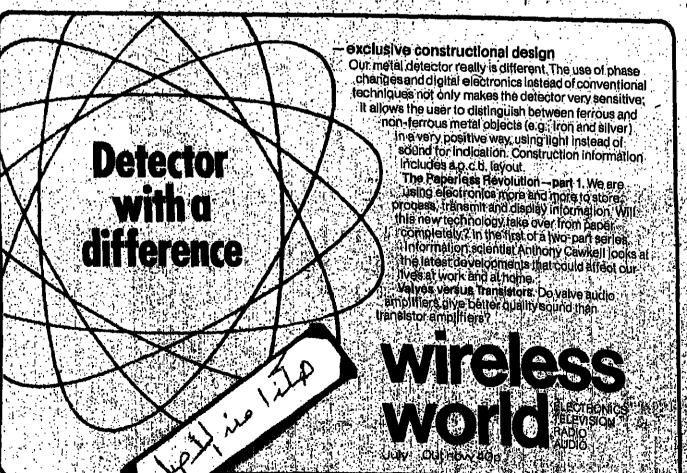
SUBJECTS of courses to be run by the NGC in the near future include systems analysis and design, to be held in the Midlands on September 11-22. Filetab programming, Manchester, September 15-3, and real time program design, Manchester, October 23-November 3, For details of all the NGC's courses contact the National Computing Central Daford Road, Manchester Mi JED, tel: 061-228-6333. /# /- /- A

COMPUTER ergonomics is the subject of a course drisinged by Tom Stewart at Loughbytough University for September 19:24. A special feature will be workshop essions on problems selected by course members to help them improve their own.

systems. Further details can be had from Tom Stewart or John Wilcox, Department of Human Sciences Loughborough Uni-versity, tel: Loughborough 63171, ext 392 or 395.

A COURSE in operations management leading to the sward by the CNAA of the postgraduals Diploms in management studies (operations specialism) is offered by Stough College of Higher Education Details can be obtained from Mrs Verbecke at the College, Slough 34585 ext 48.

THE Department of Business Studies at Hounday, Borough College is offering two evening courses in computing in the autumn term. The introduction to computers and systems soalysis begins on Tuesday Soptember 19, and the Cobo course on Thursday September 28, and each comprises ten sessions. Furthe details from the Department on 01-36



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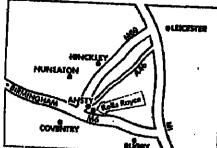






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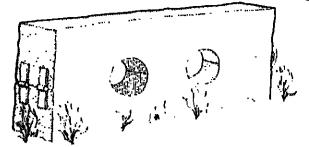
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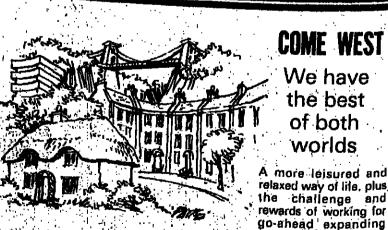
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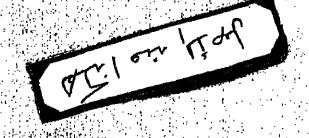
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Safe Computing is one of the fastest growing software houses in the UK with offices in Leicester, Birmingham, West Bromwich and London employing over 170 staff. The company is now opening a new division in Reading to service the south of England.

COMPUTER WEEKLY, July 27, 1978

Safe Computing specialises in production control and its package, SaFeS (Small Factory System), is the most successful product currently available in the UK achieving over 60 sales to date.

Other software packages include SOLAR, a ledger accounting package, SOFA, a market leader in solving inflation accounting problems, and SCIRT, a job costing system.

Experienced systems and programming staff are required to install and develop these packages. These staff will be based in Leicester or Reading but may be required to travel throughout the UK, Europe, or further afield.

The jobs available within Safe Computing are for those interested in applying minicomputer solutions in a practical business environment. There is plenty of opportunity for customer contact and supervision of projects through to completion.

To apply for these positions, please contact:

Mike Harrison, John Evans or John Gibb

at Leicestor (0533) 29321 or write, giving brief details of your career,

Milto Harrison, Safe Computing Ltd., 20 Freeschool Lage, Leicester,

LECTURERS

help us to maintain our reputation as: The computer company you can understand

We believe in making life as simple as possible for our customers. We provide them with commonsense customer training courses that are easy to digest with the minimum of jargon.

Which is where you come in!

We currently have vacancies for software and hardware lecturers at our South Harrow Training Centre where we teach both hardware and software courses to customers.

Our software training involves:

* Languages (high and low level)
* Operating systems

* Practical demonstrations * Hands on programming problems

Our hardware training includes:

* Machine code programming

* Big picture and logic level work related to mini computers, micro processors and associated peripherals.

* Practical work for programming and problem solving.

We would like you to lecture to customers (mostly on commercial languages and operating systems), prepare and maintain course packages and maintain a high technical knowledge. You'll teach mostly in the UK but occasionally throughout Europe.

We'd like to hear from you. You'll be offered a competitive salary and be eligible for an excellent pension scheme, Career prospects are first

Contact Janet Field at the address below:

I, Data General



SET YOUR SIGHTS HIGH - REACH THE TOP!

*Why not consider moving to a more rural arearelaxed country atmosphere

★ Take a step up the ladder-Learn new techniques-improve your prospects

★Increase your salari consider the period

MINI PROGRAMMER

Our client is a major British company with business interests in many areas. They seek programmers with at least 18 months. DEC PDP I and BASIC + experience This hardware is lewly installed and thus offers a chance to become involved in the development from the beginning Co offers —

- * Wide range of unteresting and new projects Fleviolo hours
- Excellent carear prospects
- * Annual Bunus * Salary £6,000

JUNIOR PROGRAMMER

EXCITING opening for a computer science or organizating graduate with some exposure to Mini computers. Be part of team involved in analysis, design, implementation and mainlunance of sultware for multi-computer data acquisition and control systems to meat require-ments of off-share rig in the North Sea Candictates should ideally have some exp. in REAL-TIME and have knowledge of ASSEMBLER

- * Excellent career prospects with world-wide
- oguitful coastal location in scanic countryside
- Housing is very cheap in small country towns
 First-class parks including RELOCATION ex-
- Salary to £5.000

REF: 1857

SALES PERSONS

Major world-wide organisation seeks enthusiastic self-motivated persons with proven record in sales, previous experience with computer or business machine manufacturer an advantage. Successful applicant will be selling variety of hardware or related software to industry, commerce and local authorities.

Excellent carear products t Attractive fringe parietits & Selary Expected earning \$15,000 REF. 1638

PROGRAMMERS

Prestige world-wide manufacturing company HOLLAND located in Amsterdam seeks programmers with minimum 2 years' COBOL & ASSEMBLER and PL/1 & ASSEMBLER exp. to become involved in the company of the development of sophisticated sirline communication systems.

* Excellent prospects for career path

* Varied work of a highly interesting nature

* First-class perks including RELOCATION ex-

- penses * Salary range €1,1-€13,000 neg.

REF: 1663

MINI PROGRAMMERS

HOLLAND & BELGIU We would like to hear from programmers or behalf of our clients, with good MINI exp. If you have had at least 2 years' experience of ASSEMBLER on any mini computer - contact us immediately to discuss on-goings projects in the

- * Accommodation and expenses paid by com-
- pany

 Renewable assignments * Excellent scope in a variety of areas * Salary £12,000 nag A A E.

ICL PROGRAMMERS

Due to development of their advanced computer systems, successful D.P. services dept seeks to hoost its programming team. Retaining large ICL 1900 equipment they offer excellent opportunities for persons with minimum 2 years. ICL

- COBOL & PLAN experience.

 * Training on IDMS Datebase
- Development to analysis
 Opportunities to join at SENIOR level
- Applications in various areas providing an absorbing and interesting career

 * Excellent parks include flexible working hours
- 8 WEEKS HOLIDAYS * Salary to £5,500

SYSTEMS ANALYST PROJECT LEADER DESIGNATE

International company engaged in manufac-turing, distribution and sales of well-known commercial products, seeks a person with design and implementation of either stock control, order processing, warehousing or sales forecasting systems in an IBM environment. He or she should have the potential to control project team deve-

- Paid overtime
- * Flexi hours, 4 weeks holidays
- Company expansion with additional hardwan
 Distributed processing
 Satary of C6, 500 pt

REF: 1627

PROJECT LEADERS

An outstanding opportunity exists within inter-national finance group for 2 project leaders with experience at that level on ANY hardware preferably in finencial or insurance areas, Ideal canaddy in impricial or maurance areas, idear can-didate will have dynamic personality, confidence and self-motivation, be able to lieise at all levels and responsibility to act on own decisions.

- Security in a growing organisation
 Mortgage assistance/STLS/Non-contri
- k 6 weeks holidays/sub restaurant * OPPORTUNITY TO TRAVEL ABROAD

+ Salary £7,000 +

MINI PROGRAMMERS

Prestige company operating on a global scale are recruiting persons with 1-3 years' exp. on ANY MINI ASSEMBLER to work in their new modern city offices Having large DEC PDP II equipmen and expanding at a rapid rate they have a wide range of on-going projects both in hardward and software areas.

- * Extensive training in up-to-data technology
- * Excellent career opportunities
 * Training in RSXII. RT11 and RSTS
- ★ Opportunity for luture travel
 ★ Salary £6.500 c REF 1478

ANALYST PROGRAMMER

WILTSHIRE Our client a major preservation society based in rural Wiltshire have vacancies for analyst programmers with at least 18 months' RPG!! experience. They are involved at present in taking over all major systems from their head office and have their development work planned for the next five years. Co offers —

- * Variety of exciting new development work * BEAUTIFUL rural surroundings with very
- reasonable house prices

 * Generous RELOCATION assistance

PROGRAMMERS

REF 1637

Management services division of major British group with annual turnover of almost £1,000m seeks COBOL programmer with minimum 2 years IBM or ICL COBOL. Within a project team programmers will become involved in program design, coding, testing, documentation and maintanance as well as assistance in systems Comprehensive range of applications

- loping one or more of the above systems. ★ Excellent work environment
 - cal projects and a variety of languages and
 - Paid overtime flexi hours sub restaurant

Opportunity to move to more advanced techn-

amongst many of the excellent perks Relocation expenses

Salary to £5.500

REF. 1624

JUNIOR **PROGRAMMERS**

Multi-national company retaining large IBM 370 hardware requires programmers with at least 12 months' ASSEMBLER experience to join highly professional team. They are ourrently developing a major sophisticated on-line system. Highly progressive organisation

- schedule * Good promotional prospects
- * Excellent benefits including cheep travel

 * Salary to £6,000

ANALYST PROG IMS COBOL

BURROUGHS 6700 COBOL

DL/I GOBOL PROGRAMMER

SNA ANALYST DATABASE DESIGN

IMS COBOL PROGS

PDP RSXII FORTRAN

PDP RSXII MACRO II

ANALYST **PROGRAMMERS**

One of the country's leading relationsment sucks analyst programmers to work at an loader to work at an loader to work at an analyst programmers to work at an analyst of the development of any key intensity rotate Butrough a \$700.4700 see hardware and are also investing in \$90.00 country to design analysis and/or programmers. oxp in design analysis and/or program.

(ANY LANGUAGE) to make a career with the translation of the Unusual opportunity to learn new language and got on to MINI computers

* Significant user contract

* RELOCATION proposes

* RELOCATION expenses * Salary to £6,150

REF 1655

ANALYST **PROGRAMMER**

scale seeks clear, logical thinking states grammer for their ICL 1900 series equipmen Control of small development or tupo

- Supervisory eap
 Full scale of projects ranging from puchs y
 to financial modelling
 Subsidised restaurant/dnnking club
- * Salary C5,500

PROGRAMMERS

A major organisation in the retail tade and pursuing further interests at a rapid and Retaining NCR Century equipment within Criterion V8580 schoduled for delivery at the control of the research of the rese of the year, they seek programmers with 3 year COBOL exp on any machine for their major too. control system utilising TOTAL dalabase.

- ★ Plenty of new development work
- Training in Database * Sports and social club in beautiful growt
- houted outdoor pool, squash courts ale.

 * Excollent parks -- LVs, discounts on a

* Salary to £6,250

SYSTEMS ENGINEER

World-with manufacturing company with dis in Frankfurt senks engineer for sophistic communications systems. Ideal applicant sho have in-depth experience of communications

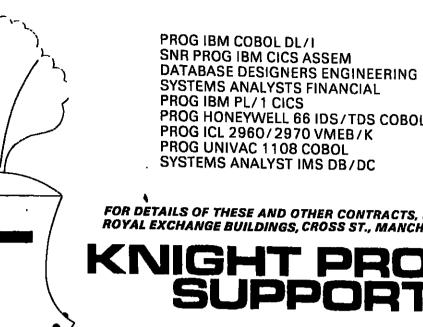
- * Relocation expanses

mussage switching on any MINI. Good long ledge of GERMAN is essential. Co offers

- * Good career prospects with excellent grown

Computing Services Association

CONTRACT MIDLANDS & N. ENGLAND



PROG IBM COBOL DL/I SNR PROG IBM CICS ASSEM

SYSTEMS ANALYSTS FINANCIAL PROG IBM PL/1 CICS PROG HONEYWELL 66 IDS/TDS COBOL PROG ICL 2960/2970 VMEB/K PROG UNIVAC 1108 COBOL

MIDLANDS NORTH WEST NORTH WEST SCOTLAND **MIDLANDS NORTH WEST** YORKS **NORTH WEST & MIDLANDS** NORTH WEST

FOR DETAILS OF THESE AND OTHER CONTRACTS, PLEASE CONTACT MR. PERRY BUTLER, 143/144 ROYAL EXCHANGE BUILDINGS, CROSS ST., MANCHESTER, M2. TELEPHONE NO. 061-833 9341/3.

KNIGHT PROGRAMMING SUPPORT LIMITED

520 ROYAL EXCHANGE, MANCHESTER M2

OFFICES: AMSTERDAM, PARIS, BRUSSELS, LONDON, BIRMINGHAM



AUSTRALIA

Management Application Systems P/L, a software consulting company. is urgently seaking experienced EDP personnel on behalf of ourselves and a number of clients in various industries. The positions are in Sydney and Melbourne and some are offering paid air fares to Australia for auccessful applicants who are able to relocate at an early date.

6 PROGRAMMERS

LOCATION: MELBOURNE A large company using an IBM 370/145 under OS requires compatent programmers on 12 and 24 months contract basis with opportunity for continual employment available after

- At least 3 years' programming experience
 At least 2 years' IBM OS COBOL programming experience
- Recognised diploma or dogree in computing
 Applicants will desirably have experience in any of the
- programming experience in another language ASSEMBLER, PL1, FORTRAN, TABN/TAB 380
- Prior experience in ICL 1904A GEORGE 2 or 2+
- return air fare UK-Melbourne 4 weeks' annual leave salary — minimum \$13,000 dependi

Applications will be considered only from people who definitely ntend to go to Australia.

The above (and other positions) offer participation in chal-

nine day (70 HR.) fortnight.

enging and interesting projects under pleasant working conditions. The successful applicants will be given all possible We will be interviewing applicants in London from 8/8/78. Written applications with detailed résumé (end telephone no for personal contact) should be submitted to R. M. Blythe, c/o M. Bretherton, Hoskyns Ltd., 145 St. John's Street, London,

CAREER OPPORTUNITY IN

IRAN

A major Iranian computer service bureau needs the following Data Processing Professionals to meet the demands of a rapidly expanding business

SYSTEMS PROGRAMMER

Minimum 5 years' experience. Knowledge of 370 Assembler, COBOL, DOS/POWER/VS. CICS essential Experience in data base design and computer systems measurement + performance enhancement would be

SOFTWARE DEVELOPMENT

Design and development of new products. Knowledge of 370 Assembler COBOL and DOS/VS plus 5 years

SYSTEMS ANALYST

At least 5 years' experience including successful implementation of at least one major project. Familiarity with on-line applications and data base management would be advantageous in satisfying the position objec-

Applicants for all the above positions should possess a University degree. Interviews will take place mid-August in London. All applications will be acknowledged.

Please submit resume in strict confidence including salary history to

> CMS IRAN-HAMBURG CO. LTD. Hamburg 1, West Germany

POLYTECHNIC DEPARTMENT OF

SENIOR LECTURER IN INFORMATION SYSTEMS
Selary Scale £6051-C7085 (bar)
C7572
Applications are invited from well
qualified candidates to teach

qualified candidates to tapen aspects of data processing to undergraduate courses in com-puting as well as courses in business studies ideally candidates well have industrial experience as well as a particular expertise in the data processing area. The suc-cessful applicant will be required to exist the descripantal training. casatu appricant will be required to assist the departmental training tutor in the placement of students in industry and an interest in this activity is therefore essential. Requests for an application form in writing only, please, to the Recultment Section of the Personal Properties of Section 2 for the Personal Properties. in writing only please, it is not a Recruitment Section of the Personnel Department. Sheffield City Polytechnic (Dept. COY), Halfords House, Fitzalan Square, Sheffield S1 28B. Completed forms should be returned by 31st August.

The Harris/Queensway Group is a repidly expanding carpet and The Harris/Queensway Group is a replicity expending carpet and furniture ratall organisation with branches throughout the U.K.. We have installed a Hewlett-Packard 3000 computer (192K bytes processor, disks, tapes ato) at our new head office in Orpington. This supports a variety of commercial work with extensive use of on-line terminals.

OPERATIONS MANAGER

ORPINGTON, KENT UP TO £5,500 p.a.

of on-line terminals.

We urgently require a manager to be responsible for all the operations function. Applicants must have at least two years experience of computer operating and preferably some supervising experience. Experience on any computer with a sophisticated operating system is relevent. The job will be particularly attractive to someone who is a fast learner and who is happy to work on a variety of tasks with little supervision, in a small installation.

No shift work is necessary and working conditions are excellent.

Roger Lawson
Group Data Processing Manager Herris Carpets Limited Harris House, 76 High Street



Data Processing Department

Bexley will start inhouse date processing from August, 1978. The equipment will consist of a 1 megabyte IBM 370/138 using DOS/VS, POWER/VS with CICS, PLANCODE AND DL/1: An extensive VDU communications network is also planned. Date entry will be by REDIFON R300.

SENIOR OPERATOR

GRADE AP3: £4,017-£4,431 including London weighting and supplement + shift allowance of 14% of basic salary and £105 per annum. Successful applicants should have at least two years' operating experience, especially on IBM Mainframes using DOS/VS.'A knowledge of JCL would be of considerable advantage.

OPERATOR

GRADE AP2. C3,564-C3.936 including London weighting and supplement + shift allowance f 14% of basic salary and £105 per annum. Applications are invited from existing IBM operators with at least one year's relevant experience.
Please wills or telephone for an application form to D. Jarvie, Operations Manager. Data
Processing Department, 9 Brampton Road, Bestleyheath, Keni; 01:303 7777 Ext. 782...
Closing date: 18th August, 1978

Bexley London Boirough

Senior Computer

Salary 63279-E4146 (including supplements), required in Berough Treasurer's Department for ICL 2904,

Consideration will be given to provision of housing ecommodation and payment of removal and legal

Application form from Borough Treasurer P.O. Box 4, Town Hell, Gosport, Hampshire (or telephone Gosport (07017) 84242, ext. 102).



For further details of the above positions and of the many others we have available in urban and rural areas — please ring our London office. 01-734 0152/3010. CONTRACT DIVISION

MESSAGE SWITCHING BURROUGHS GEMCOS HOLLAND POP FORTRAN IV REXIM

HONEYWELL SOOO GCOS GORQL FORTBAN ADV

POP HSXIIM LONG CONTRACT

DERMANY

PDP MUMPS/BASIC OR ASSEMBLER ICL GIII COBOL POP RSTS BASIC + PEXCELLENT

£400 NEG

SEXCELLENT

ANALYST PROGRAMMER/IMS 1900 COBOL BII Phone now for details of the above and other requirements
Ring Christine Kay/David Hayton, 734 0152 (24 hrs.) KNICHTER DETAMINE



HERTS BERKS HERTS SURREY KENT CRAWLEY C. LONDON

E280 p.W. £240 + P.W. £200 P.W. £250 P.W.

£220 p.W. £200 + 9 W, £200 p.W. £230 p.W. £190 p.W. HEATS



SALES PERSON HOLLAND

As Europe's largest suppliers of contract computer personnel to Holland, we require an additional sales person for our Amsterdam office. The successful applicant will probably have some sales or marketing experience. However, consideration will be given to applicants with good computer experience. Who have knowledge of Holland. He or she will be self-motivated and keen to trayel. Remuneration will include generous guaranteed basic income, and a substantial commission. We will expect a successful person to earn in the range of £15-£25,000 p.a. A car will be supplied.

Please reply to: Knight Programming Support Ltd." 27 Noel St. London W1 Telephone 01-734 0152 (24 hours)





PROGRAMMER Applications are insited from either sex for the post of Senior Systems Pro-grammer with the Computer Services Department

THE UNIVERSITY

OF LANCASTER

SENIOR SYSTEMS

This is a serier post and the appointing will be expected to provide readenthip in the imperientation of operating systems in use by the Dapartment and to addise on future developments.

addies on future developments.

The present computer is an ICL 19087. This will be replaced by an ICL 2950, briefly using DME and lear the VME. K operating system. The Benfor Systems Programmer will be suppossible for the software installation of the computer and for the depelopment of network software linking the ICL 2950 to the North-West Mercon in collaboration with other universities.

Expirience in communications action with other universities.

Expirience in communications action with other universities.

Safety on the special St. 564-67 308.

Further perfeculars to the St. 508-67 308.

Further perfeculars that the best in the Establishment of Illean University House, Leasester, LA 4 VM. is when applications (five copies) neming three polymers. in odd bar sint had lines then 31 August 1978.

Operator

expenses.
Starting salary will be dependent on age, experience and qualifications, etc.

Gosport Borough Council





Data Processing Recruitment Consultants

U.S. Banking Corporation City of London

Salaries: £6.5—8K + Mortgage

A major U.S. Banking Corporation with extensive mers. The ability to work as a member of a project computer facilities in the City requires additional D.P. personnel up to team leader level for both their Mini and Mainframe divisions.

The Mini Division in particular requires COBOL programmers and Project Leaders possibly with a Immedial background. The Mainframe Division is in need of PUI programmers with possibly

COBOL or BAL as a second language.
Whilst the IBM 370 operating system is O.S. our
Client may consider competent DOS program-

team under strict documentation and program-ming standards is important. Mini programmers will have at least two years Real-time experience using COBOL and may also have experience of ASSEMBLER.

in addition to above market salaries the Bank offers a 21/2 % subsidised mortgage facility and personal loan scheme, private health and a noncontributory pension plan.

Message Switching + Communications London or Home Counties

A prestige International Client is seeking to expand and establish new project teams working on wide and varied applications areas with employees on Data Communications areas with emphasis on Data Communications, Message

Switching and Mini Software. Can you picture yourself working in the forefront of mini systems applications and software development? Become a member of one of numerous specialist project leams in which you will make a valuable contribution whilst at the same time expanding your own frontiers of knowledge and experience.

This is a unique opportunity to enhance your career by extending your horizons and developing State-of-the-Art D.P. technology.

graduates (Computer Science or Maths) or have a very solid background in advanced computer applications and are probably aged between 23 and 33. You are presently likely to be either a Systems Designer/Consultant, Analyst Programmer or a programmer in a Mini computer environment with extensive Assembler experience. Any specialist expertise in the areas of Data communications, Message/switching. computer networks, Process-control or Mini computer software will be considered particularly advantageous.

Systems Designers + Programmers etc. Cheshire

A very prestige client with headquarters in London and regional offices located in Cheshire and throughout Europe, urgently requires the following: Real-Time and on-line Programmers, System and Data base designers and compiler specialists with 2/5 years experience.

Of particular interest would be people with relevant experience in one or more of the attributes of working with this reputable group.

Of particular interest would be people with relevant experience in one or more of the following:

Ferranti DEC with Basic, RTL II or Coral and IBM

ennance your technical expertise is one or the attributes of working with this reputable group.

Fringe benefits are well above average and full relocation expenses will of course be met.

Real-Time Software

Salaries: £10—16.5K + Outstanding Benefits

When it comes to State-of the Art Real-Time Minitorial Software our client defers to no one. They are internationally regarded as technical frontier pushers and as a valued project team member you will share their prostige and acctaim.

To meet a continued phased growth programme our client is establishing several new project teams requiring Consultants, Project Leaders, Analysis and Programmers. The latter will be well versed in August and offers made within 7 days.

RSX-11 Programmers E.E.C.+ London

Salarles: Europe c.£15K + U.K. to 9K

Our clients, ploneers in frontier communications job satisfaction and development potential the accelerated advancements in Real Time Mini Computer technology and are internationally recognised as market leaders in their field. In pursuit of maintaining their forefront leadership our clients seek to identify key personnel to join: em in their next development phase;

teal-time specialists with strong Mini Computer packgrounds experienced in the implementation of RSX-II will make a vital contribution to the it RSX.) will make a vital contribution to the interviews will be held in London early in August attainment of these goals within an environment and offers will be made to successful affering the highest standards of professionalism, candidates within 7 days.

job satisfaction and development potential.
Successful, candidates will ideally be graduates (computer science of related discipline) or will offer exceptional relevant expertence in life.
Successful applicants are likely to be currently angaged in Data Communications or Real-lime mini software development, within either a strategies and software comits or addition and software continue. systems and software group or end user environment implementing sophisticated applications software

Logistix, Freepost 32, London WIE 3YZ 01-491 4636 Telex 28800 (Reverse charges)

Avon House, 366 Oxford Street, London WIN 9HA

Software for **Avionics Systems**

CHELTENHAM

The Aviation Division of Smiths Inclustries has a heavy commitment in programmed avionic equipment now essential to the operation of modern high-speed aircraft, both military and civil.

So we are rapidly expanding our software activity to develop a variety of applications employing the most advanced systems technology.

These positions will attract specialists at various levels up to senior, with several years' relevant practical experience and a degree or equivalent in electronics, computer science, mathematics or other related subject. This includes newly-qualified graduates aiming for top-position experience.

You would work with small project teams, have computer access and considerable responsibility for your part of the software.

Real-time Airborne Software

Here you would design and program airborne mini and microcomputers for cockpit display, weapons guidance and flight control. A high level of job satisfaction-through direct contribution to aircraft performance and customer liaison-is assured.

Support Software

backs the equipment activity with the design production, adaptation and maintenance of compilers, assemblers, interpreters and design/analysis/documentation tools for airborne computer programming-including the support of a growing range of

We offer attractive starting salaries, plus the full range of benefits customary in a major international organisation-including relocation assistance to this pleasing area of the Cotswolds. If you are seeking advancement in a growth activity write to:



H. Upson, Assistant Personnel Manager, SMITHS INDUSTRIES LIMITED

AVIATION DIVISION Bishops Cleeve, Cheltenham, Clos. GL52 4SF.

SYSTEMS ANALYSTS **PROGRAMMERS**

HARROGATE

The North Eastern Region of the C.E.G.B. is responsible for the generation and main frahemisation of electricity in the eastern part of the country from the Scottlah border to south

of the Humber. The Computer Branch is responsible for The Computer Branch is responsible for computing development and production work on an ICL 19049 computer, and bears functional responsibility for Regional work on the twin IBM-370168 installation in London. and for computing developments utilizing mini-computers elsewhere in the Region. It is intended within the next 18 months to epiace file existing ICL 1904s (192K store.

ons are invited for the following posts: SYSTEMS ANALYSIS

Aprilicants for these posts should have a degree or prolessional qualification and substantial experisnce of analysis and design The salary will be within one of the following

£4860 to £6130 p.a. + 8VN 642/CW

PROGRAMMERS

Applicants with a degree or professional qualification are preferred with at least one years programming experience using Cobol or Fortran arran ICt., 1900 computer operating under George III. eljados with leak exparience, or who with the right as a programmer may become decided and a programmer of a prainted programmer.



Applications should be in writing giving detail ol age, experience, qualifications, present position and salary and be lorwarded to the Regional Personnel Manager, Central Electricity Generating Board: North Eastern Region. Beckwith Knowle Olley Road. Harrogate: HG3 1PS to arrive not late than Monday 7 August 1978:

Point of entry on all the above salary ranges will depend on qualifications and experience

EDS 60's, MT's etc., operating under George lif) by a current generation system with the capability of supporting a comprehense

capability of supporting a comprehensive communications network. It is expected that there will be a growth of distribution computing at larger Power Stations. As parely the planned development of management systems in the Region additional computing staff are required. The proposed applications include Materials Control/Purchasing. Costing and Budgeting. Work control and scheduling. Plant performance analysis, other

Plant performance analysis, other

engineering systems, maintenance and support of Production work

The salaries will be within the following

SVN 843/CW

PROGRAMMERS .

£3985 to £4930 p.a.

TRAINEE PROGRAMMERS

£3394 tò £4056 per annum.

Please quale the appropriate SVM number.

Central Electricity Generaling Board - North Eastern Region,



Computer Data **Processing** Limited

EXPERIENCED OPERATIONS STAFF

Salary £4,400 p.a. (inc. shift allowance)

Due to further expansion, experienced operators and control clarks are required to join our afficient and hard working Operations Team

The configuration consists of two large ICL System

kleally, applicants should have two years' experience on either System 4 or IBM 360/370 machines and a

Three-shift working is in operation in both the Computer Room and Control Department

A 321/2-hour week is worked plus four weeks' holiday ifter one year's service.

Our office is located very close to the main-line station (London 43 minutes and Brighton 1

Applications to Alan Merrior Oakfield House Perrymount Road Haywards Heath Haywards Heath 59188

ipc

PROGRAMMER

Required to join a small data processing departme currently operating an ICL 1901A Disc System. This system is scheduled for replacement shortly. and this is an ideal opportunity for the right applicant to gain development and installation

Suitable applicants must have a minimum of between six months-one year Cobol experience and a knowledge of ICL Systems would be

This is a progressive position offering an attractive salary, five weeks' annual holiday, contributory pension scheme, canteen facilities. Opportunities of advancement within the GKN Group.

Written applications giving all relevant details to: The Chief Accountant

The Firth Company Limited Wire Manufacturers Nora Street, Warrington WA1 2JH Tel. 0925 38881



GKN-Britain's largest international. engineering group

BOROUGH OF SOUTH TYNESIDE DIRECTORATE OF FINANCE

PROGRAMMER £3279 - £5073 inclusive

COBOL Programmer is required preferably with experience of GEORGE 2 to work in an ICL 1902A installation with input via Redifon

The configuration is under review and a major pgrade is planned for the near future.

Application forms are available from the Chief Personnel and Management Services Officer (Ref: 64), Westhoe Hall, Westoe Village, South Shields, Tyrie and Wear (Tel: South Shields 652191) and must be Sturned by noon, 11th August, 1978.



and increase your professionalism inoperations or support.

Our client is a dedicated team of computer specialists in West London, linked to a multi-national computer organisation offering a bureau service using

1904S•1904A•1902T•2970•G2/3•Communications•MAXIMOP•IDMS They offer the opportunity to gain valuable experience in this mixed environment to -

Operators and Team Leaders

You must be energetic, ambitious and capable with experience relevant to the above - at least 9 months for Operators; 2/3 years for Team Leaders-prepared for hard work and able to work under pressure. Salaries are between £3,500 and £4,200 inclusive of allowance for Operators; up to £4,700 for Team

2970 System Support

Essential experience is VME/B with particular emphasis on TP, IDMS and COMMS. This is an opportunity to be involved on the ground floor of this project, this implies a preparedness and determination to make the installation of the service successful.

Salaries are between £4,500 and £6,500.

In addition to the above a bonus scheme is in oper- There is lots more to tell you about this exciting ation, with a remuneration review in September. There are real prospects of develop-

ment and promotion for all levels of staff both inside the Operations/Support departments and outside with Sales/ Support/Applications departments.

JOOLPHIN &KERBY ITI

offer so come along to meet us and have a drink and a chat.

lf you can't make it telephone Jeff Parmenter on 01-836 1500 during normal office hours to make alternative arrangements.

Monday 31st July Richmond Hill Hotel, Richmond Hill,

Informal Interviews 8.00 AM. - 8.00 PM.

Tuesday 1st August Heathrow Hotel, Bath Road. Hounslow.

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This position will attract people who wish to combine a future in application programming and management

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Ref CW 30/1

Systems Analysts £6,000-£7,000 p.a. Dublin

Our client, a major company in the construction industry,

requires Systems Analysts for a new project team being set Applicants should have extensive systems experience and be able to demonstrate at least one successful system

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Ref, No. 266/78

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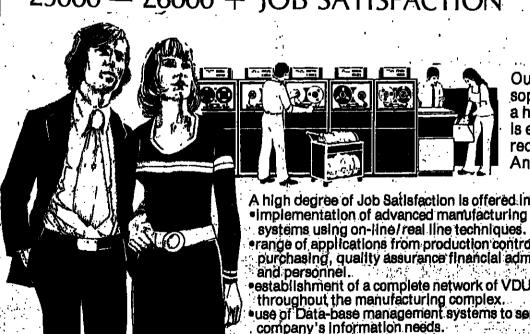
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Salary E5, 797-£6,361 p.a. (under review). Applicants should have two years in-depth system analysis experience and ability to communicate effectively with user departments; Must be self imprivated.

2 PROGRAMMERS
Selary £4 780. £5.050 p. á. (Unider/review). Applicants y
should have two years Cobol asperience on ICL 1900/

To work on IGL 2904 (40K Tapes, EDS 80's, and

O.D.E. a)
Applications include financial, inaurance and issurance, building socioly, spleries, weges, etc.
Minimum of 28 and 23 days annual leave respectively lot those posts and additional leave at public holidays estated mortgage interest (soats, Contributory passion scheme, Sigly, assaurant, Salaty, Indreases operative from 1st July, 1878 are currently being negotiated.
Requests for application forms and further information.

The General Secretary, National and Local Govern-ment Officers Association, 1 Mableson Place, London WC1H BAU, Closing date 4th August 1978

-A - C I BEN LA

ASSISTANT DIRECTOR

COMPUTING OFFICER (User Services) CL/64/CW £6954-£7308

group is responsible for the provi documentation and user support within the Leboratory Applicants for both posts should have a good honours degree and several years' experience in an area of computing relevant to the work of the section.

Further particulars and eppinsarion forms may be obtained from the Register Selford University Salford M5 - IWT. and should be returned by 21 August. 1978, quoting appropriate reference.

QUEEN MARY COLLEGE University of Landon

LECTRICAL AND ELECTRONIC

COMPUTER PROGRAMMER

This appointment often apportunity in develop versions skills advisory, and in the development and mentenance programs supporting research an earthing using Deliversity, College an Departmental computers. Applicant should have a Science or Engineering degree with programming experience prelambly PORTRAN), and misres in sessenblar codes Appointment for judicial processing the first insense, on scale £3189, £5282 p.s. (under review), plus £450 London Allowance Please apply, enclosing curriculum was and names of have referees, to the Regutare (EW), Quisen Mary College, Mille End Road, London E1 4NS, not later than 11 August.

PROGRAMMER

Applications are invited for the above post in the School of Computing Studies to take effect from 1 October. 1978 The successful applicant will be responsible for providing programming and general computing support to members of the saddemic staff in the School Preference will be given to candidates holding a degree in Computing or having appropriate professional qualifications.

Appointment will be to the scale £3189 to £5.282 (under review) plus USS benefits. Applications (one copy only), tage they with the names and addresses of three persons to whom reference may be made, should be lodged with the Dem. School of Computing Studies. University of East Anglia. Novich NR4 71J. Irom whom further particulars may be absented.

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Salery: Scale rising to £3,279 p.s. (minimum psyable at age 21 — £2,668).

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To arrange a confidential interview send resume immediately, or phone our LIK representative). Levina, beginning Monday, July 1. Levina, Royal Lancaster Hotel, Lancaster Terrace, London W2

12-18 MONTHS USA

Computer Operator....

....who wants to be a Programmer.

This is your opportunity not only to be trained as a Programmer but also to work for an international oil exploration and production company, which is expanding rapidly in the U.K.

Initially you will operate a Datapoint 6600 computer terminal, including graph plotter and digitizer, which is on line to an IBM 370 mainframe. Because you must be able to take responsibility for running the system unaided for much of the time, you will need up to a year's experience as a computer operator. The position is on a two shift basis.

We will offer a very attractive salary with top class benefits. The right man or woman will receive training as a Programmer, so career prospects are excellent.

Please phone for further details and an application form, or write to:

Tania Edwards or Howard Statham, Marathon International Petroleum (GB) Ltd. Pan Ocean Oil Corporation, 35/38 Portman Square, London W1H OBN. Tel: 01-935 3713.

Melbourne, **Australia**

A\$13,000-\$16,000

An opportunity exists for a George 3-pecialist, who has preferably had some experience in a sales support, role. Your specialist knowledge will be utilised in supporting 1900 and 2900 George Asites of which there are currently six in ICT Australia's Southern Region. You will work at a detailed Lechnical level and from time to time will be required to use your dump-cracking ability. You will also provide general systems support to a group of users in the solution of day today software problems.

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If the wide horizons we can offer in Australia attract you and you can meet our requirements, then write without delay to Carole Hudson, ICL, Bridge House North, Putney Bridge, London 5VV6 3JX, quoting reference CW1941, (Tel: 01-788 7272 ext 2047).



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Bostrom Division of UOP Limited is the world's leading manufacturer of auspension seating ior the truck, tractor and industrial equipment mar

We are currently seeking an experienced pro-grammer to join our small, but expending D.P. instellation, which utilises an IBM System 3. Model 12.

The successful applicant will have a minimum of two years' programming experience, using RPG II. and will probably have worked in a manulacturing the successful applicant will be successful.

Commencing salary will be dependent upon age and experience, and the company offers a wide range of benefits, including 28 days annual lay and contributory pension schame with free life assurance banefit.
Please write or telephone for an application below: form to Mrs. P. Cowglii at the address below:

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Computer Recruitment

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circa £6,700 p.a. + car

World-wide manufacturer and Distributive Group seek a Systems and Programming Supervisor to head a small team responsible for the review, design and development of U.K. group systems to interface with the International D.P. Network, Ideally candidate will have experience of Burroughs Hardware but enquiries are invited from persons with similar responsibilities seeking new horizons.

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A leading, independent Computer Consultancy is offering a number of opportunities to Programmers wit at least 2 years' R.P.G. II experience, to join their expanding, specialised organisation. Initially you will be based in the U.K. to become familiar with the organisation and thereafter the opportunity will be given to work in their various offices abroad. Salary £5,000 to £6,000 p.a.

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Private trading company wishes to increase their D.P. department and are currently seeking two programmers with between one and two years' experience of PL/1. The present system is an IBM 370/115 under Power VS, with Shadow as the TP monitor to a 3741 in

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COBOL AND/OR PLAN PROGRAMMERS

Programmers with a minimum of 1.2 months' experience gained preferably in a commercial er

Promotion by ment — locations: BRISTOL, BATH, POOLE, PLYMOUTH and CENTRAL DORSET

The above positions in many instances also offer substantial RELOCATION ASSISTANCE

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One of the country's fastest growing insurance companies required an online database system. to cover all aspects of its business. Could you design a highly complex database containing 1500 M bytes of data? Or solve the recovery problems Inherent in online access to such data volumes? Could you design the transaction processing monitor? Or

distributed database?

estimate the response time under widely differing loads?

Data Logic is looking for consultants and system designers for these and similar projects. Current assignments include work for banking, manufacturing and distribution, and public sector organisations. Technically, the scope of work should give unlimited opportunities to the right people.

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work with a minimum of supervision." and to deal effectively with senior Detailed knowledge of one of the following will be a distinct advantage: IMS/DL1, TOTAL, DMS2, IDMS, IDS, ~ ADABAS.

deal. In return we offer a salary of up to £10,000 p.a., a share in the profits of the country's most profitable software company, contributory pension scheme and a company car.

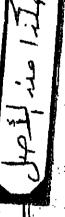
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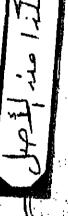
Why not call or write to arrange an informal meeting? We would like the opportunity to describe the challenges and rewards of working for Data Logic, And you'd probably like it confirmed that you are as rare as you think.

If you are some of the way to meeting our requirements, we would also like to hear from you. Prospects could be equally exciting and at Data Logic progression to the highest positions comes quicker their practically anywhere else.

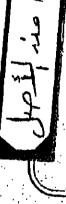
Cell of write: W. D. Barrow, Data Logic Limited, FREEPOST, Westway House, 320 Rulalip Road East, Greenford, Middlesex UB6 8BR.

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To join the new division marketing computer controlled voice response systems for data entry and file enquiry applications.

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To operate in the South East from the Reading headquarters of the highly successful UK Sales team. selling Data Communications equipment to computer-based users.

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A competitive salary commensurate with experience and ability will be paid.

The Company offers nearly five weeks annual leave and membership of a first class contributory pension scheme with free life assurance.

Applications (male or female) should write with details of age, qualifications and experience, to: DJ Kichenside, Personnel Officer, Racal-Milgo Limited, Prospect House, Thorn Street, Reading, Berks.

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We are actively recruiting programmers, analyst programmers, Consultants and Senior Consultants ants for career appointments in Western Holland. The environment you will encounter is one where high quality software design and implementation is essential, and it is important you wish to be involved professionally with individual customers' systems. The company is already established as a leader in its field and expansion planned is considerable thoroughout Western Europe. We are particularly interested in career-minded people who have had experience in an on-line, real-time environment, or switching or networks using mini-computer based systems. Projects you will encounter will be extremely varied, often extensive and usually sophisticated. Successful candidates can expect a competitive continental salary (generous tax concessions can

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Telephone me, Bill Seymour, for further details; interviews with our client will take place **全部为其他的人类的企业的工程的**。



Bill Seymour 01-637 5001

U.K. Office, Portland House, 4 Gt. Portland St., London W.I.N. 5AA
Andrew Ellis, Sarphatistreat 30, Amsterdam, Holland, Tel. (020) 264664

Accord Computer Efficiency



The Dynamics Group of British Aerospace has evolved from the best expertise and engineering knowledge being applied in this country to the design, development and manufacture of guided weapons. One of the spin-offs of our work in this field is the ability to produce Automatic Test Equipment (ATE) of the highest standard. To help us to continue our expansion programme, we are looking for people of various disciplines to work on ATE.

Group Leader - Programming Systems

The Software Facilities Department of our Automatic Test Systems Group has as its main functions the provision, maintenance, enhancement and operation of the software management and data-handling facilities required to support the generation of application and self-test software for Automatic Test Equipment. This involves compilers, editors, emulators, translators, and a dynamic management and data-handling system to serve the needs of the ATE Engineering Department.

Within the Department, we have a vacancy for a Group Leader to be responsible for two teams of Programmers, one working principally in Cobol on an IBM 370/158, the other on mini- and micro-computers in Assembler and Coral.

Candidates should have varied experience and be competent in both project and man management. In addition, ability to understand an end-user's needs will be useful.

Software Systems - Microprocessors

Weapon systems use digital processing power and, with the advent of the micro-computer, this use will extend and the applications will become more complicated in the search for improved performance. The systems will use mini-computers and micro-computers involving distributed processing, real-time, multi-processor and multi-tasking technologies, with full high-level language and host computer support. We need software system engineers/consultants to assist our Engineering Teams in tackling a whole new range of problems in the system design, assessment and test areas arising from the move from analogue to digital systems. Your background will be in Control Engineering, Electronic Engineering or Computing Science, to graduate standard. and you will have experience with mini-computers or micro-computers,

Automatic Test Equipment

We have vacancies for people who can design and develop electronic test equipment, generate the technical requirements for test sets and analyse the associated documentation, and then verify the integrity of the test package. There are also vacancies for similar people to work on mechanically orientated test equipment.

including programming in a high-level language (preferably Coral).

We require software people who are used to solving test engineering problems and who wish to apply their expertise to programming ATE and also people with experience in developing system software with an application in solving engineering problems. If you are familiar with any of the following, you could work on our executive software: Systems analysis, High-level language compilers, Assembler language, and Disc operating systems.

The salaries offered will reflect the importance of the position. Interested candidates are asked to send their career details or write for an application

Mr. P. C. Ellinger Ref: A511, Personnel and Training Dept., Site A British Aerospace Dynamics Group Stevenage-Bristol Division Six Hill Way Stevenage, Herts, SG1 2DA Telephone Stevenage 2422, Ext. 3129

BRITISH AEROSPACE DYNANJICS GROUP

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Salary package to £5790 + mortgage + +

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Our client, a major American Bank based in London, is expanding its operations staff to cope with increasing workloads and new hardware. They operate an IBM 370 using POWER and CICS plus multiple PDP 11s for a variety of communications applications Applicants for the Senior vacancies must have a minimum of 2 years' experience on either IBM or PDP

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In addition to the excellent salaries the positions also carry considerable additional benefits including free lunches, season ticket loans, non-contributory pensions with subsidised mortgages and cheap personal loans after a qualifying period.

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The Region currently operates in 1928, 1903T running under GEORGE 3, with two front encorosesors supporting a mixer batch/communications work-load. A 2903 system is also in-stalled. Future developments in-clude the replacement of the 1903T with a large-2900 con-

Shift working is involved. Salary range including shift allowance £2855-£4499 per annum. A

level of experience to join a go-altead team, please write, quoting vacancy number CW/233/ 78MR giving dozells of age and experience to the Personnel Manager, Contral Electricity Generaling Board, Heelucks Genen Road, Shirley, Solihuli, West Midlands, 890 4PD, by 4 August, 1878.

Freelance OS Cobol **Programmer** Analyst

Programmer

required for immediate contract in North Lon-

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Experience of microprocessors would be useful — but len't essential. We prefer working with graduates — or at least people of an equivalent standard. The main qualification is however, the ability to produce useful programs from a minimum of specification — after all, if we tell you exactly what to do we might be seen to the content of the content o to do we might as well write the code ourselves! If you want to know more about working for this small company in sunny Derking, then ting Chris on Dorking (0308) 87789

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DATA RECALL

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The Computer Services Department at The Royal Borough of Kensulton and Chiefses was formed during 1977. An opportunity now exists for two Junior Programmers wishing to develop their programming careers to a progressity aystems development environment. utilising the latest computer facilities and proven standards.

The Junior Programmers will be working in a project team environment coding and testing programs in COBOL and possibly RPG 11

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to £6,600 You will lead a team of development steff working on production and business systems. You must have a good COBOL background and have already led a team of programmers. The hardware is new. Relocation is available if required. LEEDS COBOL PROGRAMMERS

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Progressive installation requires BASIC 4 programmer for its PDP-11 herowers linked to IBM mainframe. Would suit a programmer with aspirations towards YORK PROGRAMMERS

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For an analyst with payroll systems

c£7,000 Our client is forming a DP consultancy

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LORIEN COMPUTER SERVICES



SYSTEMS ANALYSTS/ **PROGRAMMERS**

one write fully in confuzacion D. K. Wright, Organization 27 Stanford New Road Altrincham, Manchester

NORTH STAFFORDSHIRE POLYTECHNIC Besconside, Stafford DEPARTMENT OF COMPUTING

RESEARCH ASSISTANT optications are invited, from suitably qualified graduates. lessarch Assistant in one of the following ligids

Speech understanding systems.
Computer Archaeology — Bevelopment of giaphics, date capture systems and associated interfaces:

Salary. £2727 per annum including supplemen

A second post is evallable in one of the above group for which a Science. Research Council Sudentanip is evallable.

Further details and application forms are available from the Establishment Officer, North Staffordshire Polytechnic, College Road, Stoke-on-Trent ST4.2DE.

THE SALES BIT

The protective

PROSPECTING (3)

secretary

often they become

subtlety and common sens

from the outset.

necessary through lack of

The attitude of the sales-

particularly important in

this context. Secretaries are

not the chattels of their

masters; they are people

performing an essential secretarial function. Many

are in the job because they

have decided upon a busi-

ness career rather than a

domestic one, and as such

Therefore, any hint of

connivance, flattery, or

chatting-up techniques, is

bound to introduce com-

municative barriers. If the

salesman starts out by attempting to work with the

prospect's secretary rather

respect in order to gain it

iddress her, the next step is

n resistance only then the

positive results.

if is part of your job to help him select those salesmen

whose products could bring

most benefit to your com-

PROGRAMMER/ PROGRAMMER **ANALYST**

for the post of

DEPUTY DP MANAGER to £7,300 NORTH LONDON

Our Clients, the largest manufacturers and distributors of musical instruments in Europe, are looking for a Deputy Manager for their ICL 2904 computer department. In this post you will manage a small team of programmers and will be expected to take over the day-to-day running of the department in the absence of the Manager. You will naturally liaise closely with the Data Processing Manager, helping to define systems specifications and laying down long term plans and budgets.

The Group are about to develop two major systems:

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- A Bill of Material Processor supporting factory operation. It is intended to expand this system substantially to embrace most aspects of factory management

For this important position of Deputy DP Manager, you should be experienced in RPG II and ideally have the following attributes:

- The ability to lead a team of programmers.
- Detailed knowledge of at least one commercial system
- Have written program specifications and probably designed
- The ability to communicate with management

Here is an ideal opportunity for an experienced programmer to take a management role in an expanding computer department whose offices are located in an extremely pleasant residential area in the North of London. The Company offers all normal benefits

Ref. CW/47/1

Should this position interest you, please phone ROY HIGHFIELD Advising Consultant, for further details or preferably to arrange an

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TELEPHONE OI-353 7141 (24 HOURS)



SALES EXECUTIVES AND SUPPORT STAFF FOR U.K. AND IRELAND

Our Clients, one of the world's leading manufacturers of computers, are recruiting to meet a continued expansion within the U.K. They have a product recruiting to meet a continued expansion within the O.E. they have a product range encompassing stand-alone processors to full distributed intelligence. They are an aggressive company but the balance sheet management is conserve and the controls are excellent.

They have asked us to look for dynamic staff to work out of their offices in LONDON, BRISTOL, BIRMINGHAM, MANCHESTER and DUBLIN.

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SYSTEMS SUPPORT ANALYSTS CIRCA £6,000 + BONUS COMPANY CAR

We are looking for ambitious men or women with a wish to work in a sales environment. You should have experience in ASSEMBLER, COBOL or FORTRAN Incompage of Control TRAN, knowledge of operating systems and a general hardware understanding. You will be at present working in a user environment or with a manufacture and be looking for a more challenging career and exposure to customers.

TECHNICAL SUPPORT ANALYSTS CIRCA £7,000 + BONUS COMPANY CAR

This particular post will be of interest to experience computer or peripher engineers looking to widen their experience. You will be expected to provide technical guidance to field engineering staff, solving the more complex maintenance problems, trouble-shooting and being involved with on-job training. You will also be expected to maintain a specialised knowledge of the

Ref. CW/47/2

Applications will be treated with the strictest confidence and should be made to ROY HIGHFIELD, Advising Consultant.

HUTTON EXECUTIVE SELECTION LTD. HUTTON HOUSE HUTTON STREET, LONDON ECAY SHE

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NEW

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Our Professional Services Division provides a wide range of consulting services to Industry, Commerce and Government - both independently and in support of our Systems and Data Services divisions. These new positions arise in

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all levels and disciplines.

WE are a computer company employing

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WE are a world leader in the provision of computer services, large-scale computers and peripheral equipment.
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WE offer a challenging and rewarding career opportunity with involvement in software development, installation and support, together with some sales-related activities in the areas of system configuration and benchmarking

WE are looking for technical people of the highest calibre and offer salaries and associated benefits commensurate with the demands of the post

If you have the qualities and experience YOU may expect the possibility of travel we are seeking - please read on.

BASIC PROGRAMMER/ANALYST—£5K PLUS

Romilly Cocking or Brian Drury Q1-493 8172

COURSES

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HIGHER NATIONAL DIPLOMA IN COMPUTER STUDIES

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The Polytechnic's national course, giving a new start in maj majure students. Study is part-time evening:

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Funiter tetalle can be obtained from the appropriate Course Tr Beginnent to Computer Studies and Methematics. Franchise St Part Str. Birnhington 942 28U

each part of the examination leading Membership of the Society (MBCS).

Entolment dates for the above courses 13th, 12th, 13th September, 1978.

POLYMATHS

Please write to Mrs. Margaret Spence with full details of your career to date. Professional Services Division, Control Data Ltd., 22a St. James's Square, London, S.W.1. Telephone 01-930 7344.

WHO ARE YOU?

YOU will be intelligent, enthusiastic.

YOU will be at least 25 years' old with

several years' systems software experience

operating systems, particularly NOS/HE,

YOU may have a degree in computer

science but more essential is a sound

to communicate with customers

knowledge of operating systems, the ability

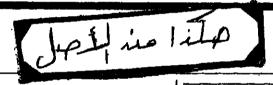
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Having said that, it is clearly better for the sales man not to get involved with the prospect's secretary other than at the courtesy level.
Often the manner of th man towards secretaries is

salesman's approach can get him straight through to the prospect without any resistance from his secretary. It is, therefore, mportant that his attitude is bold without being famil-iar, thus suggesting an ship between the prospect and himself. existing business relation are typically very indepen-dent ladies who respond badly to male chauvinism.

Of course, the salesman cannot be sure that the pro-spect will be in the office when he calls. In this situa tion it is best to ring off after establishing the best time to call again, avoiding any further discussion with

In his eagerness to sell he might just sell himself out of a reason for calling again.

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than getting past her, he will utilmately have fewer The first stage is to discover the secretary's full name, while remembering to use only her surname in US word

the first instance. The salesman needs to show processors and christian-name mode with a stranger is never ad-Having discovered who

AN exhaustive survey of over 100 different word processors is available in a 70-page booklet from Computer information Services, London, Called "All about Word Processors," it costs £10 and is a selection from Datapro's "Manual of Word Processing" looseleaf information service.

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involved in more specific reasons why the secretary PC brochure AN illustrated brochure on

printed circuit systems has been published by Ferranti Cetee Graphics. It describes the apocialised equipment developed and procedure devised by Ferranti for manufacturing artwork needed for printed-circuit his situation and a need for assistance, while stating an appreciation of the secretary's responsibilities, the saleşman can achieve production. Copies are available from Technical Sales For instance: "I am sure Office, Ferranti Catec Graphics Mr Prospect is constantly approached by salesmen Ltd. Ferry Road, Edinburgh, EH5'2XS, wishing to sell to your com-pany, and he doesn't have time to see them all. I realise

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foom, by John Race. 44pp.
65p plus 10p post and writing based around comturned, subtle observation packing. Brunel Univer-puters, and this is what slipped in, such as in a de-sity Bookshop, Kingston John Race has done with his scription of some new pro-Lane, Hillingdon. Tel: slim volume of stories and poems entitled, Tales from looking characters without poems entitled, Tales from the computer room,

HEX took one look at the armed robots. "We surrender," he

said. "Don't shoot." He didn't want Ascii to make a sulcidal

attempt at resistance; but Ascii had already disappeared

They followed him to the main gate. There a sentry

"I have come to turn these criminals over to your

security service," said Hock. "They stole my motorcycle.

The girl is a human and I suspect the android is some sort of

drop-out.

Before the guard could reply an imposing figure strode towards them. It was Zap. "Mr Hock, I presume." he said. "I understand you've had some trouble with these two

by the roadside. I want to report them to your security officer."

his ID-card authoritatively. "I'll take charge of them

personally. These are not just common thieves; they are

suspected of belonging to the Hexadecimal Kid's terrorist

gang. You may not be aware that a substantial reward is on offer for information leading to their arrest. The System

Hock beamed. "I'm not called Add Hock for nothing."
"What are you called Add Hock for?" inquired Cleo.

"Because I can put two and two together, stupid," he

Cleo decided no further comment was necessary, "Now," put in Zap, "I'm afraid we'll have to take the

motorbike in for forensic tests. You can, of course, stay

"That's very hospitable," replied Hock. "As it happens I was on my way to give a demonstration of my word-

processing package to your software manager, but as these

nere, at least until some transport can be arranged."

Ouite so," replied Hock. "They assaulted me and left me

"I am acting chief security officer." said Zap, flourishing

'Come with us," commanded James Hock.

into the thicket.

challenged him.

will be indebted to you."

involves a train. If it is a artistic sensitivity sadly sort of taste of it: thriller it will be exciting rare in the computer world and if it is a comedy it will. The piaces in his book range be funny. There is some from highly intellectual wit. thing a book range of the piaces in his property of the piaces of the thing about trains that to satire, to pathos, and all catches people's imagina equally ingenious and and helping them attain effective. There is science their goals their goals (Notice in the control of the control o

THERE is a maxim in the Race is a lecturer at One sample cannot do film industry that you can't Brunel University with a justice to the book, but I make a bad film that broadness of interest and think you should have some FEMININE INTUITION Men, think we are not of being Adam's latest rib

We can read, this they Can work out sums, and write a bit: Store stuff, remember

hooligans tore up my source listings I'll need a while to

law enforcement robots: "You can go now, thank you, we'll

if they had obeyed Zap's order. Sure enough, there they

Once inside the main building Zap put his arm round Hock's shoulder and began chatting expansively about the virtues of the PUFTA system, about which he appeared quite well informed. They quickly reached Floor D and

made their way to what Hex seemed to recall was Lambda's

door. Zap unlocked it and ushered him in. "This is your

overnight accommodation. I hope you find it comfortable.

terminal. Now excuse me for a moment: I must deliver these two to the basement cells for interrogation." He bade

"Easy does it," whispered Zap as they walked back to the

Lambda was waiting for them in the foyer. All four of them marched out together. Hex noticed that Zap had

unfastened his holster and drawn out a terminator, which

"Any trouble from you," he called out loud enough for

the sentries to hear as they approached the gate, "and you'll

he brandished menacingly in Hex's direction.

If you need anything, just request it on the viewdata

were, trotting obediently into the distance.

Hock goodnight and shut the door.

"Fine, then, just follow me." said Zap, and added to the

Hex hardly dared sneak a glance over his shoulder to see

make it presentable again."

handle this ourselves."

wants it. We're tired of condescen-

(Woman, the first, rather-

Both guards stood out to check their progress. "Orders to take these prisoners to Galactic Headquarters," explained Zap, pre-empting their questions.

"Whose orders?" "My orders," replied Zap, pointing his terminator directly

The other sentry moved fast, but not as fast as Hex who grabbed his blast-gun and stuck five digits in his interface before he could fire. Seeing this, the first one dropped his blaster and raised his hands in the air. They hustled him through the gateway.
"Where's the bike?" asked Zap.

"Follow me," replied Hex. When they got there, Ascii, who had eluded Hock's searchlight and laid low since their capture, was still waiting. They tied up the sentinel and put Cleo and Lambda

on the motorcycle.
"We'll go on foot," said Hex. "and meet you at the inter-block gap. Take care."

"See you soon," called Cleo as the machine spluttered into motion.

Hex, Zap and Ascii jogged cross-country through the night. They hadn't much time, or breath, for conversation, but in the middle of the night Zap asked, "Do you think they let us get away?" to which Hex had no reply. Reflecting on it, though, he did think it had gone just a bit too

By morning they were high up once more in the Sierra Nueva. They arrived before the girls and Hex led Zap down the secret tunnel. The last few metres, however, were blocked by an earthfall. Ascii dug, while Hex and Zap ferried stones laboriously up to the surface, to clear a passage. When they finally broke through, Hex was unprepared for what he saw.

The carpet of green moss had turned red; the tree by what had been the pond was just a charred black stump like an outsize mutchstick, and the pool itself was no more than a muddy brown puddle. Hex turned to Zap. "This place has been bombed while we were away.

Zap glanced at the rock walls of the crater which were glazed like porcelain, confirming Hex's surmise. "They must have used psycho-logic to predict your movements. There's enough data on you in the Database for them to work out an extrapolation formula. The only question is:

why were they late?"
"That's just it," said Hex. "Cleo persuaded me to leave early. They obviously haven't got her on file."

"And they obviously didn't expect an android to change his plans for a mere human," replied Zap with a mischie-"I hope she gets back soon," was Hex's response,

Were they wise to leave Cleo and Lambda to fend for them

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